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CONTENTS

Original Papers	Page
Telescopic lenses as an aid to poor vision. Abram B. Bruner	667
Operative treatment of pulsating exophthalmos. George M. Dorrance	675
Simple tarsectomy: its indications and technique. M. Beigelman	677
Some phases of secondary glaucoma. William H. Wilder	681
Ephedrine and glaucoma. Aaron Barlow	687
The influence of brightness of surrounding field or background on the size and shape of the blind spot for color. C. E. Ferree, Gertrude Rand and H. A. Wentworth	690
Phlyctenulosis and its relation to tuberculosis. Michael Goldenburg	699
William Henry Carmalt. Edward Jackson	703
Giuseppe Cirincione. F. Park Lewis	707
Notes, Cases, Instruments	
A modification of Bishop's tendon tucker. Melville Black	710
A modified tendon tucker. Edward N. De Witt	710
Society Proceedings	
Chicago, New England, Pittsburgh, Royal, Memphis	711
Editorials	
The eyes of school children, Problems of the sightless, Books on ophthalmology	724
Book Notices	727
Obituary	730
Abstract Department	732
News Items	751

For complete table of contents see advertising page V

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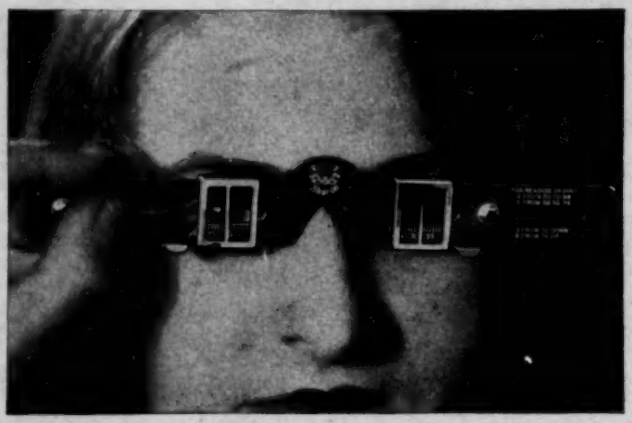

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AMERICAN JOURNAL OF OPHTHALMOLOGY
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TELESCOPIC LENSES AS AN AID TO POOR VISION

ABRAM B. BRUNER, M.D., F.A.C.S.
CLEVELAND

Practical details with regard to testing for and prescribing telescopic spectacles are discussed. Telescopic spectacles can be successfully used for near work in many cases in which with the ordinary correction the best distant vision obtainable is as low as 20/200. Vanity prevents most patients from wearing telescopic spectacles for distant correction in public. It is usually impracticable to use the two eyes together at the working distance. Absolute accuracy of frame adjustment is essential. Nineteen illustrative cases are briefly described. It is often better to omit the cylindrical correction unless it definitely improves visual acuity. Read before the Cleveland Ophthalmological Club, November, 1929.

This paper attempts to present in practical form the method of testing and prescribing telescopic spectacles, and notes some of the various types of case in which they have been successfully used.

The first attempts to improve visual acuity by enlarging the retinal image were made in 1646 by Kircher, who modelled a hand telescope. In 1667, Eschinardi designed a telescopic spectacle for near use. During the eighteenth century experimental instruments were produced by a number of investigators, and in 1785 H. Dixon patented a method of making a telescopic spectacle from two spherical mirrors, which he later replaced by two spherical lenses.

Further advances were made in the nineteenth and early years of the twentieth centuries. In recent times the problem was revived by Professor Hertel, of Strasbourg, the details of the problem being worked out in the research laboratories of Messrs. Carl Zeiss, in Jena.

Telescopic spectacles can be designed to give a magnifying power up to nearly two diameters. The usual magnification selected is 1.8 diameters, and the resulting improvement in vision is due to the image formed on the retina being nearly twice as large as the image formed by the unaided eye or with ordinary spectacles.

The spectacle is constructed according to the design of a Dutch telescope builder. Each optical combination consists of two compound units in a metal mount, namely a large converging unit and a smaller diverging unit. The two units are so computed as to insure a view free from distortion, from astigmatism of oblique rays, and from disturbing chromatic aberration. The rays are converged by the anterior compound lens, are then made divergent by the posterior compound lens, and fall upon the retina as though they came from an object nearer the eye than is actually the case, or in other words so as to produce the effect of magnification. The weight of the complete spectacle frame with glasses is about 30 gm., or slightly more than one ounce.

The trial case consists of a series of telescopic lenses to which are added spherical and cylindrical lenses, which are inserted on the side toward the eye so as to correct the patient's refractive error. There is also a second series of spherical lenses to be applied on the side toward the object for use in near work. A special trial frame capable of accurate adjustment is supplied by the Zeiss company.

By enlargement of the retinal image, the weak-sighted or extremely near-sighted person increases his visual acuity 1.8 times. For instance, a patient having a visual acuity of 20/100 secures with a 1.8 telescopic spectacle a visual acuity of nearly 20/50.

For reading, writing, or other near work it is possible to prescribe telescopic spectacles in many cases in which the best distance vision with ordinary correction is as low as 20/200.

Telescopic spectacles for distant use

Telescopic spectacles enlarging 1.3 diameters are used for extremely near-sighted patients without marked changes in the fundus, who with ordinary correcting lenses still have good vision. Here the retinal image is increased approximately thirty per cent in size and a visual field of about forty degrees is obtained.

Spectacles magnifying 1.8 diameters are used for highly myopic patients in whom fundus changes have considerably reduced the visual acuity, and in patients with amblyopia from other causes. Naturally, with enlarged magnification the visual field is reduced.

The author confesses, however, that in spite of the improved visual acuity, he has had little success in persuading his patients to wear telescopic spectacles for improvement of distant vision. He has known several patients to wear their glasses while seated on front porches or visiting art museums. Most of them, however, will not tolerate them in public for two chief reasons: first, the contracted field of vision seems to be both an annoyance and a hazard; second, even the nearly blind are vain as to their personal appearance.

Telescopic spectacles for near use

A single combination of telescopic lenses cannot be used for both distance and reading, even when the wearer is emmetropic and in possession of a fully active accommodation. Owing to the peculiar construction of these lenses, the power of accommodation is insufficient to render them useful in reading as well as distance, for the alteration in the range of accommodation produced by telescopic spectacles is much greater than that produced by the ordinary spectacle lens, and this alteration is always in the direction of an increase in accommodative effort. Theoretically, it would be possible to use the same telescopic lens for both distance and near by varying the separation between the converging and diverging lenses, but this would upset the good definition of the image.

It is usual and more restful to the eyes for the spectacles to be used as magnifying lenses with relaxed accommodation for working distance. Hence it is necessary to add a lens of such power as will make emergent rays parallel and thus replace the accommodation otherwise required.

There are two methods of obtaining this additional power: first, to add the auxiliary lens for reading to the object side of the telescopic lens. This method is followed by Zeiss. In this instance only the exact dioptric power of the working distance is required, for example +4 D. for ten inches.

Another method used in the Hamblin sets, designed in London, is to add the necessary power to the telescopic element on the eye side. The reasons given for employing this method are: first, an additional lens in front is very conspicuous and likely to be heavier than the one of smaller diameter behind; second, the lens added to the eye side improves the general definition. Both of these reasons are of minor practical importance. I have combined the two methods in some cases, an addition being made both to the object side and to the eye side.

The experience of a number of men in fitting telescopic spectacles for near use has shown us that in most cases it is impracticable to use the two eyes together at the working distance. The manufacturers of the lenses, themselves, now recommend that only one reading attachment be supplied. This can be interchanged as needed from one eye to the other. Using both eyes for reading would require convergence without accommodation and an especially accurate angling of the frames to suit the working distance

How to determine the necessary correction

It is absolutely necessary that the full correction be given in ordering these lenses. If the full correction is not ordered, the circles of diffusion are enlarged and the patient will say that he sees better without the telescopic spectacles.

To prescribe telescopic lenses accur-

ately, one must first determine the best vision obtainable with the ordinary correction. If a patient has vision of 6/60 with proper correction, then with the telescopic lens this should be improved to 6/30. As a matter of fact, however, case records will show an inaccuracy in this statement, as we may secure vision as good as 6/20.

The first step in refraction with the test lenses is an accurate fitting of the trial frame. The usual trial frame supplied is admittedly clumsy, but permits a well regulated adjustment. Fit the frame snugly; adjust the center of the trial frame aperture for the eye to be tested exactly in front of the pupil of the eye; have the frame close enough to the face for the eye side of the test lens to come 12 mm. in front of the cornea; lastly, be sure there is no anteroposterior tilt either as to the patient's head or as to the trial frame.

The spherical lens attachments designed to correct the patient's error of refraction are fitted with spring clips by means of which they are snugly and closely fitted to the telescopic combinations. The cylindric lenses, however, must be attached to a spherical lens, or, when the sphere is not needed, must be held by means of an intermediate collar.

When testing for near use, the reading attachments are placed on the side of the telescopic lens facing the object, and the reading or working distance is always roughly equal to the focal length of the lens attachment. For example, for a reading distance of 25 cm. or ten inches a +4 sphere could be attached. More powerful attachments are necessary in many cases where the visual capacity is so small as to require a larger amplifying effect.

Difficulties of adjustment

Binocular adjustment for distance. A very large proportion of the cases needing telescopic aids to vision will present such poor visual acuity in one eye that only monocular correction will have to be considered. Even where it is possible to correct both eyes, many patients will prefer a correction for only one. If the correction can be calculated the same for the two eyes, the spectacles may be so arranged that the lens can be interchanged between one eye and the other.

Binocular adjustment for near is even more difficult. It is not possible in any case where a stronger plus lens than +6.00 is needed for a reading segment. It has been my experience that patients much prefer a stronger correction and a closer reading distance than with ordinary spheres.

To try to fit both eyes for distance and for near means that the patient must learn to readjust his own frames every time he tries to read. It is much simpler to use an interchangeable segment, and, when one eye tires of reading, the object lens can be slipped in front of the other.

Trouble may arise through improper adjustment of the spectacles. Should the spectacles be tilted before the wearer's eyes, he will complain that black lines appear as having colored edges. Another source of trouble may arise in the addition of the auxiliary segment for reading. Any separation between the telescopic element and the auxiliary lens causes rapid variation in the power of the combination.

Seemingly small errors in frame measurement may entirely destroy the possibility of using the spectacles.

a. They should be worn so that the back of the lens is 12 mm. in front of the cornea. In most cases this is as close as the lashes will comfortably allow.

b. Great care must be taken in making all frame measurements. Unless your experience in this line is considerable and your time unlimited, this would best be left to a competent optician.

c. Fit the glasses for a comfortable reading or working distance. A little patience and practice will teach you this, but remember that comfortable reading distance with telescopic lenses will not always be the same as with ordinary lenses.

d. Final adjustment may only be successful after repeated readjustments

and the exercise of great patience on the part of patient, oculist, and optician.

e. It should be noted that, if desired, both monocular and binocular corrections can be supplied in the form of lorgnettes.

f. Lastly, but very important, avoid cylindrical corrections unless they distinctly improve the visual acuity, as they are very difficult to grind and add greatly to the cost.

Case reports with comment

Abbreviations: The following are routinely used:

T.E. = telescopic element
Obj. S. = object side
Eye S. = eye side
J. = Jaeger test types

Class 1. Cases of high myopia

Case 1., M.M., aged 10 years.

Visual acuity: O.D. —5.00 sph. —3.00 cyl. ax. 15° = 5/60. O.S. —5.50 sph. —3.00 cyl. ax. 165° = 5/60.
With above correction reads J. 1 with each eye.
Pathology: O.U., myopia, amblyopia, nystagmus.
Telescopic lenses: O.D. —3.00 T.E. = —2.00 sph. —3.00 cyl. ax. 15° = 5/30+1. O.S. —3.00 T.E. = —2.50 sph. —3.00 cyl. ax. 165° = 5/30+1.
With both eyes together reads 5/21. With +6.00 sph. added Obj.S. reads J.0.75 easily with each eye.

Case 2., Miss T.G.F., aged 30 years.

Visual acuity: O.D. —14.00 sph. —1.50 cyl. ax. 180° = 5/60. O.S. —14.00 sph. —1.50 cyl. ax. 180° = 5/10.
With +1.00 sph. added reads O.S. J.0.50; cannot read J.2.00 O.D.
Pathology: O.U., myopia, corneal opacities.
Telescopic lens: O.S. —16.00 T.E. = 5/4—3.
With +6.00 sph. added Obj.S. reads J.0.50.

Case 3, Mrs. L.J.S., aged 35 years.

Visual acuity: O.D. light perception only. O.S. —20.00 sph. = 5/21.
With O.S. reads J.1.50 very poorly.
Pathology: O.D. old iritis, secondary cataract; O.S. myopia, vitreous opacities.
Telescopic lens: O.S. —24.00 T.E. = 5/12+4.
With +4.00 sph. added Obj.S. reads J.0.75.

Case 4, Mrs. T.F.B., aged 28 years.

19.00 sph. —1.00 cyl. ax. 135° = 5/12.
2.00 cyl. ax. 30° = 5/30. O.S. —19.00 sph.—1.00 cyl. ax. 135°= 5/12.
With O.D. reads J.2.00; O.S. reads J.0.75.
Pathology: O.U. high myopia, vitreous opacities; O.D. divergent strabismus.
Telescopic lenses: O.D. —20.00 T.E. = 5/15. O.S. —18.00 T.E. = 5/7.5.
With +4.00 sph. added Obj.S. reads O.D. J.0.75, O.S. J.0.50.

The above group of cases illustrates results obtained with telescopic lens correction in various myopic patients.

Case 1 is an example of the average percentage improvement in visual acuity that one expects to secure by telescopic aids to vision. As this child, however, was being educated in a sight-saving school, the telescopic correction was not advised, as it was undoubtedly best not to encourage the use of the eyes for close work.

Case 2 read with comfort with her ordinary correction. She was a young woman of considerable culture, however, and derived much pleasure from a telescopic correction for distance O.S., which she used for theater, lectures, and art exhibits.

I have been unable to persuade any myopic patient to wear telescopic correction for constant use.

The third and fourth cases above might have had considerably better vision had they so desired, but both belonged to that large class of semi-illiterate and near-blind, who have become quite reconciled to their visual disability.

Class 2. Amblyopia

Case 5, Mrs. L.C., aged 38 years.

Visual acuity: O.D. +6.00 sph. + 0.50 cyl. ax. 90° = 5/5+1. O.S. +6.75 sph. +1.50 cyl. ax. 75° = 5/15.

With above correction reads O.D. J.0.50, O.S. J.1.00.

Pathology: Congenital subluxation of lens with compound hyperopic astigmatism in both eyes. Divergent strabismus and amblyopia ex anopsia in left eye.

Telescopic lens: O.S. ± T.E. +7.00 sph. +1.50 cyl. ax. 75° added Eye S. = 5/5—3.

With +4.00 sph. added Obj.S. reads J.0.50 easily.

Case 6, Miss S.M.C., aged 29 years.

Visual acuity: O.D. +1.50 cyl. ax. 90° = 5/30. O.S. +1.00 cyl. ax. 90° = 5/21.

With each eye reads J.1.00 with effort.

Pathology: Congenital amblyopia of unknown etiology and with no observable pathology.

Telescopic lenses: O.D. ± T.E. = 5/15. O.S. ± T.E. = 5/21+2. Addition of cylinders does not improve.

With +5.00 sph. added Obj.S. reads J.0.50 easily with either eye.

Case 7, Mr. H.W.C., aged 67 years.

Visual acuity: O.D. +1.00 sph. + 1.00 cyl. ax. 60° = 5/4—1. O.S. = fingers at 2 feet, unimproved.

With +2.50 sph. added reads O.D. J.0.50, cannot read J.2.00 O.S.

Pathology: O.D. facial palsy, lagophthalmos, corneal anesthesia. O.S. Congenital amblyopia.

Telescopic lens: O.S. +3.00 T.E. = 5/21.

With +2.50 sph. added on Eye S. and +5.00 sph. added on Obj.S. reads J.1.00 with O.S.

Case 8, O.R., aged 8 years

Visual acuity: O.D. +6.00 sph. +1.00 cyl. ax. 90° = 5/60+1. O.S. +6.00 sph. +1.00 cyl. ax. 90° = 5/60+1.

With +3.00 sph. added reads only J.2.00 with each eye.

Pathology: This boy had congenital cataracts, which were successfully operated on at three years of age. He also presented alternating concomitant strabismus, and amblyopia, with temporal pallor of each optic nerve, and a variable horizontal nystagmus.

Telescopic lenses: O.D. +3.00 T.E. +3.00 sph. added Eye S. = 5/15. O.S. +3.00 T.E. = +3.00 sph. added Eye S. = 5/30.

With +3.00 sph. additional added on Eye S. and +7.00 sph. added on Obj.S. reads J.1.00 readily with either eye.

The various cases which I have classified under the general heading of amblyopia are of unusual interest.

Cases 5 and 7 were both patients of introspective and neurotic type, who seemed to live in fear that some calamity might deprive them of the use of their only useful eye. The prospect of help offered by telescopic correction of the amblyopic eye was particularly pleasing and reassuring.

Case 6 presented an economic side. This young lady worked as a bookkeeper! She was almost embittered by her visual disability, and had been to more than a dozen oculists in the hope of securing improvement by the usual corrections. Yet in spite of the marked improvement with telescopic lenses she refused their aid, probably because of personal vanity and fear of her employer's criticism.

Class 3. Corneal opacities

Case 9, Miss V.R., aged 21 years.

Visual acuity: O.D. —6.00 sph. = 5/30. O.S. —6.00 sph. = 5/30.

With O.D. alone reads J.1.50; O.S. alone reads J.1.75; both eyes J.0.75 slowly.

Pathology: O.U. corneal opacities from old interstitial keratitis, myopia.

Telescopic lenses: O.D. —6.00 T.E. = 5/10+1. O.S. —6.00 T.E. = 5/10+3.

With +4.00 sph. added Obj.S. reads J.0.50 easily with either eye.

This is presented as an example of satisfactory improvement in a case where the outstanding cause of poor vision was the corneal opacities. In numerous cases of denser macula and leucoma the results with telescopic lenses have been disappointing. The probable explanation is that most of these cases are securing vision through a very small, relatively clear area of corneal tissue, through which the optical arrangement of the telescopic lens cannot be made effective.

Case 4. Lenticular opacities

Case 10, Mrs. M.S., aged 70 years.

Visual acuity: O.D. —2.00 sph. = 6/21. O.S. —1.50 sph. = 6/12—1.
With +3.50 sph. added reads O.D. J.1.50, O.S. J.1.25.
Pathology: O.U. immature cataract.
Telescopic lenses: O.D. —3.00 T.E. = 5/10. O.S. ± T.E. with —1.50 sph. added on Eye S. = 5/7.5+3.
With +5.00 sph. added Obj.S. reads O.D. J.0.50 poorly, O.S. J.0.50 easily.
Ordered telescopic correction for reading O.S.

Case 11, Mrs. J.E.W., aged 60 years.

Visual acuity: O.D. —2.00 sph. = 6/12+1. O.S. —1.75 sph. = 6/12 +1.
With +3.00 sph. added reads J.1.00 with each eye.
Pathology: O.U. incipient cataract.
Telescopic lenses: O.D. —3.00 T.E. +1.00 sph. added Eye S. = 5/6. O.S. —3.00 T.E. = +2.00 sph. added Eye S. = 5/6.
With +5.00 sph. added Obj.S. reads J.50 easily with each eye.

Case 12, Mr. J.L., aged 75 years.

Visual acuity: O.D. —3.00 sph. = 5/21—1. O.S. —3.00 sph. = 5/10 —3.
With +4.00 sph. added reads J.1.75 with each eye.
Pathology: O.U. immature cataract.
Telescopic lenses: O.D. —3.00 T.E. = 5/10. O.S. —3.00 T.E. = 5/7.5.
With +6.00 sph. added Obj.S. reads J.0.75 easily with either eye.

In prescribing telescopic corrections for cases of incipient and immature cataract, we have no panacea for the cure of their disease. I feel it wise in every such case to explain to the patient the probable temporary character of the assistance given.

Certain patients, however, offer good reasons for advising the use of telescopic lenses: those patients with very slowly growing cataracts, who are poor operative risks (cases 10 and 12); patients whose chief complaint centers about the loss of ability to read (cases 10 and 12); lastly, those patients with early cataract who already magnify their visual disability, and who have developed a mental state of hopelessness and suspicion (cases 11 and 12).

Class 5. Old iridocyclitis with partial occlusio pupillæ

Case 13, Miss A.R.T., aged 50 years.

Visual acuity: O.D. 5/60 unimproved. O.S. 5/30+1 unimproved.
With +3.00 sph. added for near cannot read J.2.00.
Pathology: old iridocyclitis with partial occlusio pupillæ.
Telescopic lenses: O.D. +3.00 T.E. = 5/60+1. O.S. +3.00 T.E. = 5/21+2.
With +4.00 sph. added Eye S. and +7.00 sph. added Obj.S. reads O.D. J.2.00, O.S. J.50.

Case 14, M.F., aged 40 years.

Visual acuity: O.D. fingers at 5 ft., unimproved. O.S. fingers at 6 in., unimproved. Cannot read J.2.00.
Pathology: old iridocyclitis with partial occlusio et seclusio pupillæ.
Telescopic lens: O.D. ± T.E. = 5/30.
With +8.00 sph. added Obj.S. reads J.1.00.

The results obtained in these two cases are so good as to require little comment. One will probably note the strong addition made for near in case 13. This will be commented upon more fully in the summary following. Case 14 presented an important economic factor, as a man practically blind was so helped that he now works every day

in the recorder's office of an adjoining county.

Class 6. Retinal and choroidal diseases

Case 15, Judge T., aged 73 years.

Visual acuity: O.D. 4/60, eccentric fixation, no glass improves. O.S. 5/60, emmetropic, no glass improves.

With +3.50 sph. added O.S. reads only large newspaper headlines.

Pathology: O.U. peripheral lenticular opacities, senile macular choroiditis.

Telescopic lens: O.S. ± T.E. = 5/30.

With +3.50 sph. added Eye S. and +8.00 sph. added Obj.S. reads O.S. J.0.50 slowly.

This patient had been a great student and author of several law textbooks. He died December 23, 1928, after having used his telescopic spectacles for over three years, reading with ease for many hours each day.

Case 16, Mrs. B.V., aged 62 years.

Visual acuity: O.D. plano = 2/60. O.S. plano = 5/30.

With +2.50 sph. added, J.2.00 poorly with left eye only.

Pathology: O.U. disseminated retinochoroiditis.

Telescopic lenses: O.D. ± T.E. = 5/60+1. O.S. ± T.E. = 5/12—1. With +3.00 sph. added Eye S. and +4.00 sph. added Obj.S. reads O.S. J.1.00.

Case 17, K.E., aged 35 years.

Visual acuity: O.D. +1.50 sph. +1.50 cyl. ax. 90 = 5/21—1. O.S. +3.00 sph. =5/21+2.

With each eye reads J.1.25 poorly. Does all his reading with O.D., however, as O.S. diverges and has slightly eccentric fixation.

Pathology: O.U. old luetic disseminated choroiditis.

Telescopic lenses: O.D. ± T.E. + 1.50 sph. added Eye S. = 5/15. O.S. +3.00 T.E. =5/12.

Cylinder addition on O.D. did not improve.

With +7.00 sph. added Obj.S. reads O.D. J.0.50, O.S. J.0.75. Fixation in O.S. is very poor, so ordered telescopic correction for reading O.D.

The favorable results shown in the three preceding cases might be entirely misleading. Very often an attempt to fit telescopic lenses to patients with retinal and choroidal disease proves to be a failure. The ophthalmoscopic appearance of the fundus gives no clue to the amount of help which may be secured. Evidently the enlarged image must fall on a certain minimal number of viable rods and cones to give us the desired improvement.

Class 7. Optic atrophy

Case 18, Mr. H.F.P., aged 59 years.

Visual acuity, March 16, 1926: O.D. +1.75 sph. =5/10+4. O.S. +1.37 sph. =5/21—1.

With +3.50 sph. added reads O.D. J.0.75, O.S. J.1.75.

Pathology: O.U. optic atrophy, patient has a complete bitemporal hemianopsia and has twice been operated on for suprasellar cyst.

October 27, 1927: Distant vision as above but temporal field contraction has now reached area of central fixation in O.D., and he reads only large print with this eye. With O.S. now reads J.1.25 with his own glasses, showing some improvement.

Telescopic lens: O.S. ± T.E. +1.00 sph. added Eye S. = 5/12+2.

With +3.00 sph. added Eye S. and +5.00 added Obj.S. reads O.S. J. 0.50 slowly.

January, 1929: Patient reports his general health is excellent. He can now read, however, only with his telescopic lenses, but is able to continue his business as the head of a large corporation.

Case 19, L.W.A., aged 19 years.

Visual acuity: O.D. 5/60, no lens improves. O.S. counts fingers at 6 in., no lens improves.

Pathology: O.U. postneuritic atrophy, the result of mastoiditis and lateral sinus thrombosis.
Telescopic lens: O.D. ± T.E. = 5/30.
With +4.00 sph. added Eye S. and +12.00 sph. added Obj.S. reads J. 0.50 slowly at 10 cm. (Note the large addition for reading.)

This boy had been two years in college, using a +12.00 spherical lens as a magnifying glass. With this held about 12 mm. in front of the cornea and the printed page held about three inches away, he had read all his textbooks. Having acquired the habit of close range, he would not be satisfied with a reading correction with focal distance further than 10 cm.

Summary

Telescopic lenses have brought to us a valuable aid for many afflicted patients. The cases cited above show a fair variation in the pathological findings. Some of our corrections may rightfully be criticised by other men who have prescribed such lenses. Undoubtedly, some of these cases show lack of experience in the early days in which we attempted to order telescopic lenses. Having tested several hundred cases to date, a few general observations and impressions may be given.

(a) We seldom prescribe corrections for distance use, but telescopic aids for near vision are a means of renewed joy of living to the most intellectual class of patients, who enjoy reading.

(b) Practically all patients with poor visual acuity, who suggest the slightest hope of benefit, are tested in the office with telescopic lenses. Therefore, the percentage of corrections ordered is very small in comparison with the number actually tested.

(c) Cylindrical corrections may be omitted unless they definitely improve the visual acuity. As the inclusion of a cylinder considerably increases the cost of the lenses, this item may be important to patients in poorer circumstances.

(d) It is our practice to add for near work segments which will give the best visual acuity regardless of the reading distance. Patients using telescopic lenses for reading soon learn to maintain the eye in steady fixation and to move the paper or book slowly from right to left. A reading distance of 10 cm. is, therefore, often more comfortable than a correction with longer range.

(e) In most cases the full reading correction is put on the object side. In a few cases this adjustment may be varied. Where a patient's presbyopic correction is +2.50 sph. or more, it has now become my custom to add this amount first to the eye side and then to build up the rest of the needed reading correction on the object side. Certain English authorities believe this tends to improve the general definition of the image.

1214 Guardian building

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OPERATIVE TREATMENT OF PULSATING EXOPHTHALMOS

GEORGE M. DORRANCE*, M.D., F.A.C.S.

PHILADELPHIA

A week or two after ligating the common carotid, all the branches of the external carotid are ligated, except the internal maxillary and the superficial temporal. The author disapproves of ligation of the veins of the orbit, as excessively dangerous. Read before the section on ophthalmology of the College of Physicians of Philadelphia, December 19, 1929.

The etiology of exophthalmos has been so well described by Drs. de Schweinitz and Holloway in their monograph on this subject that I shall not discuss this phase.

The outstanding symptoms, as you know, are partial or complete loss of vision, protrusion of the eyeball, edema of the conjunctiva, and pulsation of the contents of the orbit. A distinct bruit may be heard with each beat of the heart.

An autopsy in these cases reveals an abnormal opening between an artery and a venous sinus, the most common being an opening from the internal carotid into the cavernous sinus.

The pressure in the internal carotid artery is greater than that of the cavernous sinus at the time of the pulse beat, hence the flow of blood from the artery through the abnormal opening causes the noise which we call a bruit.

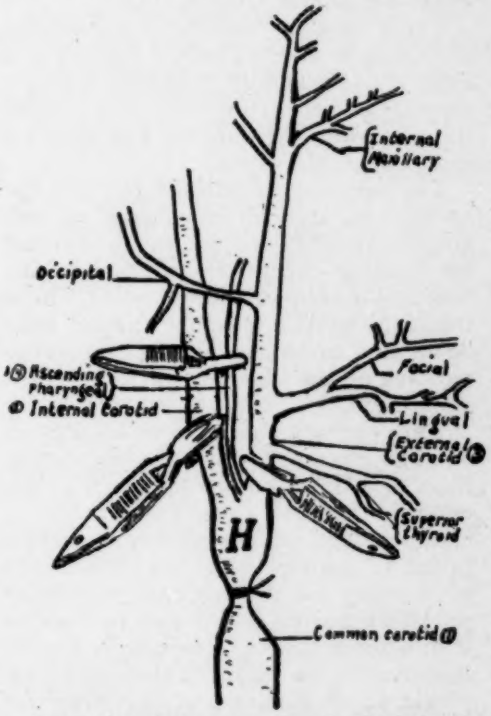
The normal flow of venous blood is from the veins of the orbit into the sinus, but with this abnormal opening between the artery and the sinus the pressure in the sinus is increased, causing a back-flow into the veins of the orbit, this resulting in exophthalmos. The pulsations are due to the flow of the blood from the artery into the sinus.

A few cases of pulsating exophthalmos are recorded in which the symptoms disappeared without treatment, but in advising delay of treatment one must remember that irreparable damage may occur while waiting.

It is surgically impossible, at least at the present time, to repair the opening between the artery and the sinus, hence our efforts are directed toward reducing the pressure within the artery to a point where the bruit ceases and back pressure disappears.

The usual procedures advised are:

1. Ligation of the common carotid on the affected side. This operation is especially of value in the older subject, as a collateral anastomosis is less likely to occur. In the younger patient, following this procedure, the bruit disappears but recurs in a short time.



Operative treatment of pulsating exophthalmos (Dorrance).

2. Ligation of the internal carotid. This will practically always reduce the pressure, but as the only collateral circulation possible is through the circle of Willis, we not infrequently have such a reduced circulation to that portion of the brain supplied by the in-

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ternal carotid that a hemiplegia occurs.

When ligation of these vessels is undertaken, the operation must be done under local anesthesia. In the case of the common carotid the ligation should be a gradual cutting off of the blood stream rather than an immediate blocking.

If ligation of the internal is done, the wound should be left open and the patient's condition constantly observed, so that if any untoward symptoms develop the clamp may be removed. Paralysis usually occurs in the first twelve hours after ligation, though it may not appear for twenty-four or thirty-six hours.

The procedure which I am desirous of calling to your attention tonight is a method of reducing the pressure in the internal carotid artery, and at the same time avoiding the dangers encountered in ligating this vessel.

The common carotid is ligated in the usual way, and within a week or two all the branches of the external carotid are ligated, except the internal maxillary and the superficial temporal. These branches of the external carotid may be ligated at one or more sittings, depending on the amount of arteriosclerosis present.

This operation was developed after having observed several interesting facts in connection with ligation of the carotids. In one case, I noted that a clamp placed on the common carotid failed to control the bruit; when I placed one on the internal, the bruit promptly ceased, but I had to remove it in a short time as hemiplegia began. Removal of the clamp caused the hemiplegia to disappear and the bruit returned.

In the case I am now presenting I ligated the common carotid, and three weeks later, after reopening the wound, I noted that the internal and external carotid were well distended and apparently pulsating. This was due to the collateral circulation, an anastomosis occurring between the branches of the two external carotids.

I then decided to see what effect clamping the venous vessels would have. By following the diagram, the procedures tried may be readily understood.

I will call the ligature on the common carotid number 1. A clamp was placed on the internal carotid—we will call this number 2. A clamp placed on the external carotid is number three, and one on the ascending pharyngeal we will designate number 4.

The space H, you will note on the diagram, is that portion of the vessel's area lying between ligature number one and the clamps numbers 2, 3, and 4.

If I removed clamp number 3 and pressed the blood out of the space H and reapplied the clamp, the space H remained empty.

If I removed clamp number 2, the cavity filled slowly but not under pressure; if I now pressed all the blood out of space H and reapplied clamp number 2 and released clamp number 3, the cavity filled and was under pressure.

If I now pressed all the blood again out of space H, and reapplied clamp number 3 and released clamp number 4, the cavity again filled up, but very slowly and under very slight pressure.

These observations proved that the internal carotid became a branch of the external after ligation of the common. They likewise explain why ligation of the common is a less serious operation than ligation of the internal.

Up to the present writing, the method I have advised has proved most satisfactory. Should it fail after giving relief for months or years, I should reopen the wound and ligate the internal carotid, for it would have obtained its collateral circulation and this would be a safe procedure.

I have never seen the rationale of ligating the veins of the orbit, though in the literature a few good results are reported following this procedure. In a number of the successful cases, however, a previous ligation of either the common or the internal carotid had been done. Ligation of the veins is not without danger and I am opposed to this procedure.

2025 Walnut street.

SIMPLE TARSECTOMY: ITS INDICATIONS AND TECHNIQUE

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The manner in which tarsectomy influences the trachomatous process is analyzed with particular attention to the mechanical factor of relieving the lid pressure. Corneal involvement and beginning entropion are accepted as indications for this procedure. In the technique of simple tarsectomy an incision through skin and orbicularis is favored. A new method of intermarginal tarsectomy with transplantation of mucosa is proposed for cases of advanced trachoma with misplacement of cilia.

Extirpation of the tarsus has a history of almost fifty years. Introduced by Heisrath[1] in 1882, it found its greatest exponent in Kuhnt,[2] who advocated the widest use of this procedure in the treatment of trachoma. In time considerable opposition developed toward the Königsberg school, and reports appeared which tended to discredit entirely the value of tarsectomy. However, in looking over the discussions on this subject during the last decade, one notices an increasing amount of favorable comment from ophthalmologists who are working in trachomatous areas—from Birch-Hirschfeld[3] in eastern Prussia, from Feigenbaum[4] in Palestine, from Hassan Barrada[5] in Egypt, and from Strachov[6] in Russia. The latter's report is particularly interesting because it shows that in the author's country there has been a decided change from an attitude of general skepticism to one of enthusiastic support of tarsectomy.

A rather cautious and indefinite opinion in regard to the value of tarsectomy was voiced by Peters[7] in the last edition of the authoritative Graefe-Saemisch "Handbuch der gesamten Augenheilkunde". This must be attributed to the fact that Peters, as he admits himself, has had no personal experience with the method. In the literature Peters' view has been subjected to severe criticism by Gernet[8], whose previous favorable report[9] on excision of the tarsus deals with an exceptionally large number of cases (758 simple and 781 combined tarsectomies).

Under these circumstances, a general justification of tarsectomy is hardly necessary. The question to be decided, at present, is not whether excision of the tarsus is to be practiced at all, but when and how it shall be done.

In order to establish the exact place of tarsectomy in the treatment of trachoma, the factors which are responsible for its beneficial results must be analyzed.

In one of the recent discussions on this subject G. Freeman Heal[10] states that after removal of a hypertrophied tarsus "the cornea is covered by a soft fleshy curtain and not by a hard resisting visor, hence the improvement in the pannus". He also thinks that "the operation itself causes a local blood-letting and brings an increased supply to the part". While these reasons have some foundation, one must agree with the author that "such suggestions are hardly a sufficient explanation" for the marked improvement of the trachomatous process which so often follows the excision of the lid tarsus.

It is our opinion that the great value of tarsectomy lies in a permanent relief of orbicular pressure upon the cornea. The orbicular muscle, in trachoma, is kept in a state of spastic hypertonicity through constant reflexes from the diseased conjunctiva. This is aggravated by the hypertrophy and engorgement of the mucosa and, in later stages, by a cicatricial contraction of the total lid structure.

On the other hand, the avascular cornea depends for its nutrition on proper functioning of the lymphatic channels. Excessive pressure upon its lymphatic system results in an impaired state of nutrition and increases the possibility of ulceration or pannus formation. Under these conditions tarsectomy relieves the eyeball from abnormal pressure by removing a considerable amount of the tissue between the orbicular muscle and

the globe. One can easily appreciate the meaning of this if he transfers the same rubber ring (orbicular muscle) from the thumb (eyeball and tarsus) to the little finger (eyeball only): the decrease of pressure will be felt without difficulty. In addition, the operation, when it is done through an external incision in the eyelid, results in severing many of the muscle bundles, with a subsequent cicatrization which, in the end, probably interferes with orbicular spasm.

In his interesting work on the importance and the measurements of lid tension Birch-Hirschfeld[11] states that with a specially constructed instrument he found the lid pressure in cases of trachoma with corneal complications considerably higher than in normal eyes, and he justly attributes to this factor an important place in the etiology of pannus.

The same view was seemingly held by the late S. Lewis Ziegler[12], judging from the following sentence in his paper on the surgery of trachoma: "These corneal lesions will automatically disappear whenever the lid tension is properly relieved".

No other procedure reduces the lid pressure as effectively and permanently as does a tarsectomy.

Another important effect of tarsectomy is the prevention and correction of the most dreaded trachomatous complication, entropion. In the type of entropion which is due to incurving of the thickened tarsal plate, its removal brings a complete cure. When the entropion is caused by cicatricial contraction of the tarsal conjunctiva, and in trichiasis, tarsectomy alone is insufficient and a supplementary transplantation of mucosa, as will be shown later, is necessary. The most striking feature, however, is the prophylactic effect of tarsectomy. In a series of more than sixty cases in which I performed simple "transpalpebral" tarsectomy, not a single instance of subsequent entropion was noticed, although many of these cases were under observation for a period of four to five years. In preserving the normal position of the eyelid, excision of the tarsus proved to be even more efficient than in preventing or improving corneal complications.

Once the manner in which a tarsectomy influences the course of the trachomatous process is properly understood, the indications for this procedure can be easily established. Excision of the tarsus has no place in the early stages of trachoma, when neither corneal complications nor entropion are to be feared and when satisfactory results can be expected from conservative treatment. It is of interest to note that at this early stage tarsectomy, that is, the dissection of the cartilage from the conjunctiva, is difficult and at times technically impossible. I do not agree that the advisability of tarsectomy depends upon the condition of the tarsus. Thickened and even distorted tarsi may be present without any ill effect upon the cornea or upon the position of the lid, and a tarsectomy in those cases would be unnecessary surgery. On the contrary, I have removed many seemingly normal (but microscopically always pathological) tarsi when the course of the trachomatous process required it, with the most gratifying results.

Consideration of the way in which removal of the tarsal plate affects the trachomatous eye will also determine, to a certain degree, the type of operation to be used.

It is hard to see why any part of the conjunctiva should be removed with the tarsus. The extensive or unextensive sacrifices of the conjunctiva that were advocated for the treatment of trachoma forty or fifty years ago were in accordance with the idea of those years, that the trachomatous process was limited to the tarsal conjunctiva or to the fornix, and that "radical" surgery might bring a cure of trachoma. As a result of numerous contributions to pathology in the last two decades we know that trachomatous changes are found quite early in the subconjunctival tissue, in the bulbar conjunctiva (Pokrovsky)[13], in the tarsi (Spasski)[14], in the lacrimal glands (Michail)[5], and so on.

One cannot expect to cure trachoma

by removing any part of the conjunctiva. Exposed as the conjunctiva is, it can be subjected easily to some kind of therapeutic procedure with satisfactory results. The most important argument, however, against any sacrifice of conjunctiva is the general tendency towards cicatricial contraction which characterizes the trachomatous process. It is true that in many cases this tendency is insignificant. But one cannot always predict the future course of the disease, and whoever has observed remote results of combined tarsectomy in cases which later underwent extensive cicatricial changes, will deprecate any operation involving the loss of a

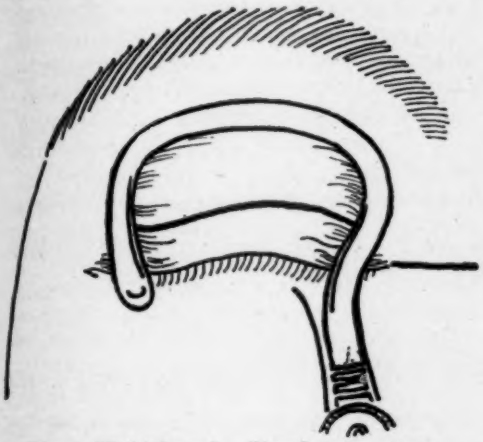

Fig. 1 (Beigelman). Simple tarsectomy.

part of the conjunctiva. The choice should be, therefore, a simple excision limited to the tarsal plate.

Respect for conjunctiva, which is incompatible with the idea of "combined" tarsectomy, determined also some other changes in the technique of this procedure. I place the incision through the skin and orbicularis, as advocated first by Kuznetsoff[16]. This eliminates the extensive scar in the conjunctiva which follows the usual method of tarsus excision, as well as the troublesome conjunctival sutures. This transpalpebral tarsectomy allows the use of any blepharostat, so that the operative field is kept entirely bloodless.

With a cantothomy, which is advisable in all cases of tarsectomy, and with a simplified insertion of sutures, the technique employed is, step by step, as follows: infiltration anesthesia with two percent novocain-adrenalin—injection both under the skin of the eyelid and under the cocainized conjunc-

Fig. 2 (Beigelman). Simple tarsectomy.

tiva; cantothomy; introduction of Snellen's large blepharostat; incision two millimeters above and parallel to the lid margin through the skin and orbicularis (figure 1). A few strokes with a scalpel or scissors expose the tarsus. The latter is retracted down with a

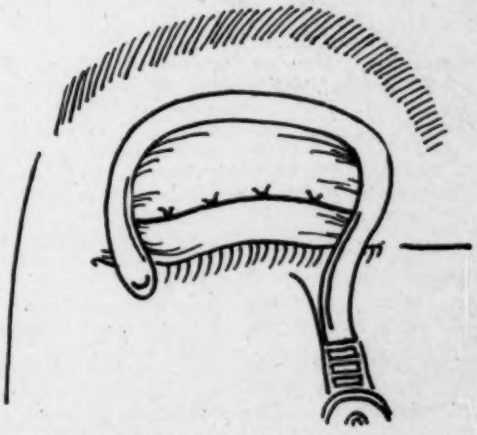

Fig. 3 (Beigelman). Simple tarsectomy.

hook, and this brings out clearly its upper convex border. A slight incision is made with a scalpel (figure 2) to expose the upper margin of the tarsus sufficiently to get hold of it with a forceps. With the knife turned toward the tar-

sus, the latter is carefully dissected from the conjunctiva. After its dissection is completed, the tarsus is cut off with straight scissors. Three or four sutures are sufficient to close the wound (figure 3). I have taken these sutures out as early as forty-eight hours after their insertion, without any ill effect.

The cosmetic result of the operation is always good. The scar, if it is parallel to the border of the eyelid, is not visible. There is no ptosis. Neither is there any notch in the middle of the lid margin as seen at times in other methods of tarsus extirpation.

When the entropion is accompanied by a misplacement of the cilia, the operation can be modified in the following way: incision in the intermarginal space separating the tarsus from the orbicularis, as in Kuhnt's procedure for senile ectropion of the lower lid; excision of the cartilage; transplantation of the mucous membrane from the mouth into the intermarginal space.

Conclusions

1. Relief of lid pressure and prevention of entropion are the outstanding merits of tarsectomy.
2. Tarsectomy is not indicated in early trachoma when the prospects of conservative treatment are good.
3. Corneal complications, or beginning entropion, and not the condition of the tarsus itself, constitute indications for a tarsectomy.
4. An incision through the skin and orbicularis in the removal of the tarsus has certain advantages as compared with the conjunctival incision.
5. For cases of entropion complicated by misplacement of cilia, an intermarginal tarsectomy combined with transplantation of mucosa is proposed.

1244 Roosevelt building

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SOME PHASES OF SECONDARY GLAUCOMA

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Classifying secondary glaucoma as (1) mechanical and (2) biochemical or inflammatory, the author discusses especially the biochemical or inflammatory type. The use of mydriatics in such cases should be very cautious, and usually limited to homatropin, the action of which can be controlled more readily in case of necessity. Read before the Kansas City Society of Ophthalmology and Otolaryngology, January 16, 1930.

It is customary to consider the forms of glaucoma as acute and chronic, simple and congestive, primary and secondary, but such divisions should be made with the understanding that there are no definite boundary lines between them. It seems to me it might be well to simplify our nomenclature, as suggested by Elliot, by describing glaucoma as congestive and noncongestive, primary and secondary. But it should be recognized that noncongestive forms may at any time become congestive, and that the boundary lines of primary and secondary forms frequently overlap. Indeed it may be that many cases regarded as primary glaucoma will by more careful and more refined study prove to be secondary in the sense that the principal sign of the condition, namely increased intraocular pressure, is secondary to underlying conditions, either mechanical or biochemical.

For this reason it has seemed to me that consideration of some of the phases of so-called secondary glaucoma would be of interest in helping us to appreciate more fully some of the complexities of the condition.

It would seem that glaucoma is not a disease per se in the sense that typhoid, scarlatina, and diphtheria are disease entities, but rather a symptom complex, of which increased intraocular pressure is the dominant feature. It is pretty generally held by clinicians that without the dominant condition of hypertension there is no glaucoma, but this view must be qualified by the thought that anatomic or altered circulatory conditions may exist that at some favorable time may lead to increased intraocular pressure.

For purposes of study it may be convenient to classify the causes of secondary glaucoma as (1) mechanical, (2) biochemical or inflammatory.

It must be agreed, however, that there are no fixed boundaries here and that either cause may initiate the process. As examples of conditions that operate mechanically to induce hypertension, we must mention:

1, intraocular tumors, of either iris, ciliary body, choroid, or retina;
2, prolapse of iris through corneal wounds, anterior synechiæ, posterior synechiæ with seclusion of the pupil;
3, intumescent cataract, traumatic cataract;
4, subluxation of the lens either partial or forward into anterior chamber;
5, post-operative glaucoma
   (a) after cataract extraction with entanglement of iris or capsule in the wound,
   (b) after discission of capsule,
   (c) from downgrowth of epithelium into the anterior chamber through the corneal wound after cataract extraction.

Some of these conditions bring about hypertension by directly blocking the filtration angle, as would occur with tumors at the root of the iris or of the ciliary body, with downgrowth of epithelium through the wound for cataract extraction, or with masses of lens substance in the anterior chamber after injury of the lens. Others act by forcing the iris forward so that its root blocks the angle and prevents egress of fluids through the pectinate spaces. Examples of this are seen in iris prolapse with anterior synechiæ following perforating wounds of the cornea; in intumescent cataract, either spontaneous

or traumatic; in luxation of the lens either lateral or into the anterior chamber; and with strands of lens capsule adhering to the wound in the cornea after discission for membranous cataract.

In complete annular synechiæ, the flow of fluids from the posterior into the anterior chamber is impeded and a condition of iris bombé results, the root of the iris blocking the filtration angle. If not promptly relieved this may become a permanent peripheral synechia.

In the case of intraocular tumors of the choroid (usually sarcoma) or retina (retinoblastoma) the tension is usually not elevated until the growing mass noticeably increases the contents of the globe. In such cases there may be extensive detachment of the retina, and as the vitreous becomes compressed the lens and the root of the iris are pushed forward, resulting in blocking of the filtration angle.

In some cases, however, a small tumor may cause glaucoma even before it has attained a size sufficient to cause extensive detachment of the retina or to seriously compress the vitreous. In such cases it may be that irritating products of the growth may so affect the circulatory apparatus that there is a greater transudation of fluids than can be taken care of by the spaces of Fontana. These may be further clogged by the cellular elements and pigment that escape from the irritated ciliary body and iris.

Again a small growth may be so placed that it presses on a vorticose vein, thus impeding the outward circulation, causing congestion and excessive transudation of fluids. This in turn forces the lens and the iris forward to permanently block the iris angle and to bring on the congestive form of glaucoma.

Most of the conditions to which we have referred, with the exception of some tumors and possibly to some extent traumatic cataracts, act in a mechanical way to raise the tension by shutting off the egress of fluids, thus disturbing the normal balance of the circulation.

I wish, however, to bring more particularly to your attention the second group of causes of secondary glaucoma, which I have chosen to call biochemical or inflammatory.

Inasmuch as our knowledge of them is still so indefinite and incomplete, we might with reason speak of them in general as irritative causes, for the sympathetic nervous system plays some part in the problem of glaucoma, as every observant clinician knows. Cases of this group form some of the most difficult that confront the ophthalmologist. They usually begin as a low-grade anterior uveitis, that is, a mild serous iritis or iridocyclitis, often without pain or redness of the eye. The patient may notice some blurring of vision or floating spots that prompt him to consult the oculist.

The examination may show normal or nearly normal vision. Ciliary injection may be absent or very slight in the milder cases, or may be present in the more active ones. The pupil may be of normal size but somewhat sluggish, and the anterior chamber of normal depth. There may or may not be corneal precipitates. Usually the loupe or the corneal microscope discloses them, and also, at that time or later, pigment dust may be seen on the anterior capsule or on the iris. Fine dust-like opacities may be seen floating in the vitreous, not enough to obscure markedly the details of the fundus, nor to greatly lower the vision. The disc may or may not show a glaucoma cup, but the veins may show some engorgement, and a very slight pressure on the eyeball with the finger will elicit the retinal pulse. Such a case is one of mild serous iritis or cyclitis, in which increased tension is not suspected, but on use of the tonometer we may get a reading of 30 or 40 mm. or even more (Schiøtz).

In the examination of such a case one should be cautious about the use of mydriatics, beginning with the milder ones such as euphthalmin one per cent solution, which may give sufficient dilatation to determine whether posterior synechiæ are present, and to allow

more careful study of the anterior chamber, vitreous, optic disc, and choroid. If synechiæ prevent dilatation of the pupil and the tonometer shows no increase of tension above that first observed, homatropin one or two percent may be tried and may give the desired pupil enlargement without increased hypertension. If the case is of some duration, synechiæ, if present, may not break down with these mild means, and in this instance levoglaucosan may be tried before resorting to atropin. Levoglaucosan acts as a powerful mydriatic and in such cases seems not to raise the tension.

With good dilatation one can study the anterior chamber more carefully with the slit-lamp microscope for cellular elements, pigment, and so on, and with the ophthalmoscope can also see more clearly, especially in the periphery, fundus changes that might escape detection through a smaller pupil. Of course, one must realize that he is treading on dangerous ground and must be prepared to contract the pupil if the tonometer shows marked increase of tension. If miotics must be resorted to, I prefer in such cases pilocarpin hydrochloride or nitrate not over one percent solution, rather than any form of eserin, as the former seems to be less irritating to the delicate iris tissue. For the same reason I use pilocarpin by preference in any mild case of noncongestive glaucoma in which long continued use of a miotic is indicated, getting the desired effect by more frequent applications.

Having determined that the case is one of anterior uveitis, the most diligent search should be made for any possible source of focal infection. This should include not only thorough examination of teeth, tonsils, nose, and sinuses, but also examination of more distant parts such as gall-bladder, kidneys, intestinal tract, urinary bladder, urethra, prostate in men, and vagina and uterus in women. Clinical and laboratory tests for syphilis as well as those for tuberculosis must be made. The tests for the latter are not to be limited to a perfunctory Pirquet skin test, but should include the subcutaneous injection of tuberculin with the usual precautions. Careful blood tests should also be made. If such examination reveals any focus of infection it furnishes a point of attack in the therapy.

Too frequently, in my experience, such a thorough examination has failed to reveal a culpable focus, in which case one is forced to believe either that the examination has been incomplete or that some mysterious influences of a toxic nature are at work to excite inflammatory changes in a sensitive uveal tissue. Cases such as I have briefly referred to give support to the idea that the problem of glaucoma is something more than an anatomic condition of interference with the outflow of fluids. It involves also the question of the inflow and the mechanism of the formation of the intraocular fluids as well as the nature of them. It would seem evident that an irritative factor like an inflammation would affect such a mechanism and would also alter the physicochemical character of the fluids themselves. Such cases would seem to support the theory of dialyzation, which holds that the intraocular fluids (aqueous) originate by a process of dialysis from the blood of the capillaries, predominantly of the ciliary processes, possibly in part of the iris, the dialyzing membrane being the capillary walls.

Recently Duke-Elder, in a monograph on the nature of the intraocular fluids (British Journal of Ophthalmology, 1927) and also in his "Recent advances in ophthalmology, 1929), supports this theory by description of elaborate physicochemical experiments and observations. He thinks there is a "continuous process of reciprocal exchange on either side of the capillary walls, determined by the difference in hydrostatic pressures; an osmotic flow in the opposite direction conditioned by the relative osmotic pressures, a diffusion out or in of the diffusible substances according to their differences of concentration."

This theory has evolved from the view advocated by Hamburger that no circulation of fluids takes place in the eye, but that its metabolism is carried on by a process of cellular interchange. Duke-Elder thinks that the "existence of a circulation such as is described by Leber cannot altogether be denied, but that the aqueous is practically without circulation under normal pressure conditions, although circulation to a minimal degree may be imposed upon it secondarily. Such a circulation in mass might be brought about by contractions of muscles of the eyeball."

He speaks of it as "an ebb and flow throughout the eye with a tendency towards diffusion from the iris and ciliary body to the angle of the anterior chamber."

Probably in such cases of secondary glaucoma the permeability of the ciliary walls is altered through irritation by the toxic elements of the inflammation, thus allowing the colloid elements of the blood plasma to enter the eye. Krogh ("Physiology of the capillaries", 1922) and others have shown that the capillaries are relatively impermeable to colloids, but when dilated their walls become more permeable, so that all the elements of the blood plasma may be able to pass through them. This would explain the increase of the protein and cellular content of the aqueous in cases such as we are considering, and represents a view that has been held by Troncoso for years. Such increased permeability of the capillaries is regarded by Thiel as a diagnostic sign. (Klinische Monatsblätter für Augenheilkunde, 1922, volume 68, page 244; also Archiv für Augenheilkunde, 1925, volume 96, page 331.) He claims that after giving sodium fluorescein by the mouth it can be detected as a fluorescence in the pupil by means of the slit-lamp in cases of iritis and glaucoma, while in the normal eye no such appearance occurs.

It would seem that the presence of colloids and other elements of the blood plasma, that escape from capillaries whose walls have become more permeable because of dilatation and the toxic influence of inflammation, must affect the natural outflow of the ocular fluids much as do the masses of protein lens substance when they escape into the chambers of the eye after development of a traumatic cataract. The difference is more of degree than it is of kind.

Sclerosis and thickening of the fibers of the pectinate ligament and the contraction of the spaces of Fontana, as pointed out by Henderson, may contribute to the result, the albuminous content of the aqueous blocking up the already contracted spaces. But hypertension does not develop in all eyes even if such adverse conditions as we have been considering are present, and we are forced to accept the correctness of the dictum of Fuchs that "genuine glaucoma develops only in an eye that has a predisposition to it." Of what such predisposition consists we do not know. It may have an antomic basis with hereditary influences. At any rate, the observant clinician recognizes that the "glaucomatous eye is a sick eye," with a background of disturbed metabolism, toxic influences, overwork, harassing worries and misfortunes that cause emotional stress; an eye that presents in many of its secondary forms some rather definite pathologic findings.

Treatment

In the treatment of primary glaucoma we are confronted with the difficulties that arise from our lack of definite and accurate knowledge of the etiology. If we knew the cause exactly we should be on the way toward a rational prophylaxis and therapy. Lacking such definite knowledge we are forced to rely on therapeutic measures that are largely empirical.

We treat the main symptom of the condition, increased intraocular pressure, and even if we are successful in this we cannot be sure that the glaucoma is cured or will not recur if we discontinue miotics, or if the fistulizing cicatrix that has been made by operation fails to drain off the excess fluid.

This does not apply to the same extent to cases of secondary glaucoma, for

here we have a rather more definite point of attack. This is particularly true of those conditions that bring about hypertension mechanically. Intraocular tumors, whether of iris, ciliary body, choroid, or retina, are usually malignant and demand their prompt recognition and removal of the eye, and the sooner the better, for statistics show that if the growth goes on to the stage of perforation or even to the irritative stage in which hypertension of the eyeball is present the chances of metastasis are greatly increased.

Anterior synechiæ may sometimes be released by skilful surgery. Hypertension from posterior annular synechiæ may be controlled by suitable iridectomy. Extraction of intumescent cataract or of traumatic cataract will often reduce the hypertension caused by the swollen lens, whose substance may be blocking the filtration angle. Extraction of subluxated lenses if successfully performed will promptly relieve the hypertension caused by them.

The glaucoma following cataract operations is not so amenable to treatment and suggests the importance of prevention by greater care in the technique of operation. Entanglement of iris and capsule in the wound can often be prevented. If the iris is found to be prolapsed at the first or second dressing, it should be carefully freed and excised under strict asepsis. This would better not be done until the third day, by which time most of the wound will be rather firmly united.

Downgrowth of epithelium into the chamber can be prevented by clean corneal incision, proper toilet of the wound, and exact replacement of the conjunctival flap.

The treatment of cases of secondary glaucoma of biochemical or infectious origin gives us greater perplexity. If the case is one of active iridocyclitis we must use every endeavor to discover the antecedent causes of the inflammation. In the meantime we must resort to the old empirical remedies of quiet rest in bed in a darkened room, hot fomentations to the eye and surrounding parts several times daily for periods of twenty or thirty minutes (sometimes they are not well borne), bleeding from the temple, active purgation, sweating once a day (if not contraindicated by a weakened condition of the patient), and hypnotics or opiates in case of pain. I should avoid the use of adrenalin in such cases, especially subconjunctival injection of it, for the same reasons that it is avoided in acute and hemorrhagic forms. Dionin may be used, as it is supposed to abstract fluid from the eye. The same may be said for the subconjunctival injection of isotonic or normal solution of sodium chloride.

In both the acute and the chronic form of glaucoma, Duke-Elder found that the tension was distinctly lowered by intravenous injection of thirty per cent solution of salt, 1 c.c. per kilogram body weight, that is, about 50 c.c. for an average adult dose, slowly administered. Weekers, Hertel, and others report similar results with weaker solutions, and Larsen has obtained beneficial results from administering the salt by mouth. Duke-Elder advocates also giving the salt by mouth in larger doses than he uses intravenously, or per rectum by enemata. Whether such treatment is applicable in cases of the kind we are considering I cannot say, for I have had no experience with it, but, if as stated there is produced by such measures a hypertonic state of blood and in consequence an abstraction of fluids from the eye, it would seem to be applicable.

The burning question in such cases of secondary glaucoma is: "Shall we use mydriatics or miotics, and if so when and how long?" This question cannot be answered alike for all cases and the clinician must use his best judgment and "trust to luck." We want to have the pupil dilated to prevent adhesions of the iris to the lens, and we do not want it dilated too long or too much for fear that the root of the thickened iris will still further block the spaces of Fontana, already clogged with albumen and cellular detritus.

For such reasons I usually avoid atropin, cautiously using homatropin,

which can be more readily controlled by miotics if it is observed that the tension rises still higher. Often in mild cases, and even in severer ones, in which the iris is not too markedly involved, the dilatation, by breaking down the adhesions, promotes the flow into the iris angle without increasing the tension.

If there are adhesions of the iris that do not yield to mild mydriatics, levoglaucosan may be tried. This acts as a powerful mydriatic, and recent synechiæ quickly yield after three or four instillations. At the same time it is supposed to lower the tension, but of this I cannot be so sure. It certainly has not done so in my cases of chronic noncongestive glaucoma, and in the acute form Hamburger himself avoids it because of its mydriatic effect.

As to miotics in these cases, I prefer the milder ones such as pilocarpin nitrate or muriate, for they seem to irritate the sensitive iris less than eserin. There is not the same indication for a strongly contracted pupil as there is in primary glaucoma. The anterior chamber is not very shallow, sometimes quite deep even at the iris angle. However, an entirely different picture may be present if there is an annular synechia, for with this one may have iris bombé with shallow chamber even at the angle. In such a condition we must try to break the adhesions with mydriatics, and if the condition is a recent one this may be accomplished at least in part and the result may be a fall in tension. If it is not accomplished an iridotomy of the ballooned iris or an iridectomy may be required.

If the inflammatory process in the uveal tract subsides, either because of the eradication of foci of infection combined with our treatment or because of the vis medicatrix naturæ, the natural tension may be restored and the eye may become quiet, more or less damaged depending upon the severity of the attack. The hypertension may continue or there may be recurrent attacks, and the question of operation arises. Of course, any operation that we do is directed only against the increased intraocular pressure as I have already mentioned. As to the best operation, the condition of the case and the judgment of the operator must decide.

Iridectomy would seem to be preferable if numerous old iris adhesions are present, but this would better be done in periods of quiescence, although this rule is not invariable. An operation giving a good filtering cicatrix such as can be accomplished with a properly performed Lagrange operation may be the best for the case. Trephining in my experience has not been so satisfactory as it causes more traumatism to the eye and the opening becomes blocked up by the colloid substances and the pigment.

I have had better success with iridencleisis or iris inclusion operations, if there are few or no synechiæ. The traumatism to the eye is slight, and the fluids escape readily through the fistula. However, with many of these cases, as with many of acute primary glaucoma and as with those of secondary glaucoma of the mechanical kind that I have mentioned, we must sadly admit that the only way to relieve the hypertension is by enucleation.

They furnish illustrations of the saying of an old medical philosopher, somewhat of a cynic, that "surgery is the despair of medicine". Of course, he never knew of the brilliant successes of modern reparative surgery nor of the many life-saving operations made possible by modern aseptic technique, but in the main his epigram still holds good. We enucleate, we excise, we amputate and immerse the specimen in a laboratory jar or bury the subject in toto, sometimes both, but rarely by surgery do we truly restore an organ to its proper function.

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EPHEDRINE AND GLAUCOMA

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In five cases the acute onset of glaucoma has appeared to coincide with the use of ephedrine for the treatment of nasal conditions. All yielded promptly to eserine, two were operated upon and three were not, and the ocular condition of the nonoperated patients has remained as good as that of those who were not operated upon, although none of them has continued to use a miotic. The evidence is not conclusive but further observations should be made. Read before the section on ophthalmology of the College of Physicians of Philadelphia, February 20, 1930.

In our text-books on pharmaco-therapeutics, it is asserted that ephedrine has no effect on intraocular tension. My experience with a number of cases of acute glaucoma, in the past two years, has created a doubt in my mind as to the absolute accuracy of this statement.

One evening in December, 1927, I was called by an attending physician to see a woman of fifty-five years whom he had been treating for a cold in the head. She complained of supraorbital pain and nausea. Her left eye revealed all the classical symptoms of acute congestive glaucoma. The pupil was semidilated, irregular and immobile; the anterior chamber was shallow; the cornea was steamy and anesthetic. The globe was moderately injected and the intraocular tension was increased. Ophthalmoscopic examination revealed a totally dark pupil, so that there was no fundus reflex and, of course, no fundus view. The eye was blind. I prescribed eserine one percent, and salicylates internally. Not wishing unduly to alarm the patient, I explained to the daughter—a sensible girl of twenty years who accompanied me to the door—the seriousness of the ailment and the importance of using the drops regularly every two hours night and day. I promised to see her again the next day. Before I left, I also mentioned the probable need of an operation.

When I reported my findings to the doctor the next morning, he asked me whether the drops, mentioning ephedrine, which he had prescribed for the patient's nose had, in my opinion, anything to do with the glaucoma. I told him that I did not think so. When some months later another case with a similar history came to my attention, the doctor's question whether the ephedrine had anything to do with it, which evidently lay dormant in my subconsciousness, immediately claimed my attention. After seeing three additional cases of like nature the question appeared to me worthy of consideration.

Let us now return to our first patient. When I saw her again on the afternoon of the following day, there was a distinct improvement. The response to the eserine was prompt and decisive. The pupil was fairly well contracted, although still irregular and somewhat larger than that of the other eye, and the tension was normal. The ophthalmoscope revealed a clear pupil, so that I was now able to obtain a fairly good view of the fundus, which appeared normal. The disk was of good color and there was no cupping. Vision had returned, the patient saying that she was now able to see with that eye just as well as with the other eye. I advised operation. The patient hesitated and, as she improved, finally refused. I argued that without operation she would have to use the drops a long, long time, probably all her life. This she promised to do. But, like many good promises, this was soon broken. After being under my observation about a month, she disappeared. Several months ago (about two years after I first saw her) she reappeared in my office, complaining of pain and lacrimation in the same eye. She was very much frightened, thinking it was the same trouble. Upon examination, however, I found only a mild infection of the lacrimal sac which cleared up after

a few irrigations. The eye itself was normal. The pupils were equal, the tension normal, and there were no visual field defects. Vision without glasses was 6/9 in each eye, with + 0.50 sphere =6/6 in each eye.

The second case was that of a woman of fifty-two years. About the middle of December, 1928, she contracted influenza and sinusitis. Ephedrine for the nose was prescribed by the attending physician. Five days later she developed pain and dimness of vision in the right eye. When I saw her several hours later, she presented all the symptoms of acute congestive glaucoma in that eye, with vision reduced to light perception. Eserine was used with the same happy result. The next day there was good contraction of the pupil; tension and eye-grounds were normal and vision was restored. I advised operation. The patient consented and iridectomy was performed on December 24, 1928. The patient has since been under observation, and when last seen about a month ago the tension and eye-grounds were normal. Vision: right eye, 6/9; left eye, 6/12; with correction 6/6 partly in each eye.

The third case occurred in a male aged fifty-five years. He was seen on the afternoon of May 7, 1929, and was complaining of pain in the eyes and blurred vision. On the morning of the same day he had had a nasal treatment with ephedrine. The right eye presented all the symptoms of acute glaucoma. Tension taken with the McLean tonometer was 80 mm. in O. D. and 28 mm. in O. S. Vision with his glasses: O. D. 6/30; O. S. 6/9. About an hour after eserine was instilled there was a noticeable contraction of the pupil. Eserine was prescribed for home use. On May 9—two days later—the tension was 28 mm. in each eye and vision with his glasses 6/9 plus in each eye. The haziness of the fundus which had been present on the first day had disappeared, the disc was of normal color, and there was no cupping. I did not mention operation in this case. There has been no recurrence.

The fourth case occurred in a woman of about fifty-eight years, whose history was similar to the above. Some hours after ephedrine was used nasally, she noticed that she could not see well with the left eye. It was not inflamed, but the pupil was semidilated and fixed; the fundus was hazy; vision was greatly reduced and the tension was increased. Eserine was used. Two days later the pupil was contracted, the tension was normal, former vision was restored, and the eye-grounds appeared normal. Operation was advised but refused. There has been no recurrence so far.

The fifth patient was a female of sixty-three years, whom I saw on May 25, 1929, and who complained of headache, nausea, dimness of vision, and pain in the right eye. She had been treated for sinus trouble several days before and ephedrine had been used in the nose. Examination revealed acute inflammatory glaucoma in the right eye. Tension was 90 mm. in O. D. and 30 mm. in O. S. (McLean). There was no view of the fundus and the eye was blind. Eserine was used with good effect. When the patient was seen again two days later, the tension was normal and vision was greatly improved, but the eye was still inflamed. Operation was advised. The patient consented, and iridectomy was performed on May 31, 1929. She was last seen on January 15, 1930. Tension and eye-grounds were normal. Vision with + 2.00 sphere was 6/9 in each eye.

It may be interesting to note that of the five patients one was a male and four were females. This is in accordance with the generally accepted fact that females are more subject to acute glaucoma than are males.

This paper is a presentation of personal experiences with what may prove to be an interesting and serious problem. That the ephedrine was the cause of the glaucoma in these cases requires confirmation. Of course, it is possible that the ephedrine had nothing to do with the ocular manifestations and was a mere coincidence. Nevertheless, the close association of the drug with the disease is so striking, and the sugges-

tion of cause and effect so strong, that the thought of a possible relationship between the two cannot be easily dismissed.

It is worth noting that the patients were all past middle life, when the susceptibility to glaucoma increases. Also, all five belonged to the Jewish race and were thus predisposed to glaucoma by racial heredity. It is possible that ephedrine has no effect on intraocular tension in young persons and in persons with no glaucomatous tendency, but that, like atropin and other such drugs, it may act as an exciting cause in persons with a glaucomatous predisposition.

On the other hand, we must remember that the ephedrine was used because sinusitis was suspected, and that one patient had influenza, so that these conditions may have been the real exciting causes of the glaucoma. All this, of course, is mere speculation and must so remain until we have more information on the subject.

The only reference in the literature I could find on the question was an article by H. Campbell Orr in the Practitioner for April, 1929, in which the author reports that in fifty glaucomatous eyes in which ephedrine two percent solution was instilled there was no rise of tension, and that in twelve cases a slight fall was noted. This would appear to be a point against any suspicion that ephedrine may cause glaucoma. And yet it may be questioned whether the fact that the drug did not cause a further rise of tension in a glaucomatous eye is sufficiently convincing evidence that it may not precipitate an acute attack in a predisposed individual.

I am planning to carry out a series of experiments in an effort further to elucidate this matter and would urge my confrères to do the same. It appears that work along this line would be well spent. We must remember that ephedrine is being used more extensively every day, and, while I have no comparative statistics on glaucoma, it seems to me to be on the increase. Any contribution to such an important subject as glaucoma ought to be worth while.

An interesting point worth noting is the result of the treatment in these five cases. In every case the disease was diagnosed and treatment begun within twenty-four to forty-eight hours after the onset. All responded favorably to the miotic used. Two were operated on, and the three who were not are doing as well as the two with operation, although none of them has continued to use miotics. Assuming that the glaucoma was caused by the ephedrine, it would appear that this is a type of glaucoma which readily yields to non-operative treatment.

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THE INFLUENCE OF BRIGHTNESS OF SURROUNDING FIELD OR BACKGROUND ON THE SIZE AND SHAPE OF THE BLIND SPOT FOR COLOR

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The distance of the center of the blind spot from the center of the field of vision for the achromatic and chromatic stimuli averaged 16.5 degrees and ranged from 14.5 to 17.5 degrees. The blind spot was larger for a black test object on a white field than for a white test object on a black field. The blind spots for chromatic stimuli were all much larger than for achromatic stimuli. Other findings relate to variations in size of the blind spot for different colors as seen upon backgrounds of varying brightness. As to satisfactory technique, gray of the brightness of the color as background gave the best and white the worst results.

Many incentives, scientific and practical, have led to the study of the size and the shape of the blind spot. Some of these have been indicated in previous papers[1,2]. Those pertaining to practical applications are of paramount importance.

In relation to the practical aspects of the problem there is great need of coordinated and systematic investigation. In partial fulfilment of this need we have planned and are making a series of studies having the following objectives: (1) A determination of the size of the scotoma for achromatic and chromatic stimuli. Obviously, in any series of studies relating to ophthalmic and other practical applications, it is of great importance to know at the outset whether we are dealing with one or a plurality of scotomata. A careful study of this point has already been made and the results published in a previous number of this Journal[2]. (2) An investigation of the nonpathological factors which influence the size and shape of the blind spot for achromatic and chromatic stimuli, both for a given eye and from eye to eye. As in the case of the visual fields the influence of factors of the former class can be eliminated entirely or reduced to a satisfactory minimum, and for factors of the latter class data can be obtained from which a great deal can be accomplished in the way of making the needed corrective allowance. (3) The formation of a diagnostic scale based on the results for a large number of cases sampled broadly to include as many as possible of the factors whose influence cannot be eliminated. When completed this scale will show the distribution of results that may be expected both for pathologic and nonpathologic eyes. The difficulty of basing a satisfactory diagnosis on the average blind spot should be obvious to anyone who has had an opportunity to inspect the scatter which is obtained in a large number of nonpathologic cases, even when the results have been obtained with a control of factors which gives a very close reproducibility in the case of a single eye.

A survey of a somewhat voluminous literature shows that there has been a great deal of disagreement in the results obtained with regard to the distribution of achromatic and chromatic sensitivity around the blind spot. Some of this may have been due to individual differences in the eyes investigated, but doubtless the major portion of it can be attributed to the lack of a standard set of conditions under which to work. Until the variable factors which influence its size and shape have been discovered and controlled, there is little chance of doing work on the blind spot with the degree of precision or reproducibility that is needed to make it of any considerable value either for practical or scientific purposes.

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Two of the more recent incentives to the study of the blind spot may be noted here. (1) There is a scientific interest in knowing the conditions of sensitivity around the papilla or entrance of the optic nerve. This has an important bearing on many points of theoretical and systematic interest. (2) Changes in the size and shape of the blind spot are among the earliest indications or effects of various pathological conditions which may be discovered by any type of examination or test.

The reasons for an effect of these conditions on the blind spot are obvious. A few of them may be mentioned here.

(1) All of the nerve fibers which distribute to the retina enter through this foramen whose subjective manifestation is known as the blind spot.

(2) The peripheral layers of nerve fibers distribute immediately around the blind spot; those toward the center, in order, further out on the retina. Any inflammation or infection spreading from surrounding structures, for example the sinuses, will thus attack the peripheral layers of fibers first and affect first the visual functions of that part of the retina immediately surrounding the blind spot.

(3) In distributing to the zone immediately surrounding the foramen, the peripheral fibers of the nerve bend over the scleral ring forming the boundary of the foramen. They are thus liable to damaging pressure from many causes. (a) Any increase of pressure or tension in the eyeball, as in glaucoma, presses back or cups the nerve head. This forces these peripheral nerve fibers against the scleral ring and both pinches and stretches them to a damaging extent. (b) Any interference with the drainage of lymph from the interior of the eye through the optic nerve to the lymph spaces of the brain causes a swollen or congested condition of the nerve which becomes particularly injurious at the foramen or entrance to the eye. This swollen condition of the nerve head, commonly called "choked disc", causes a damaging pressure on the nerve fibers, particularly on those fibers in contact with or near to the scleral ring. (c) The elongation of the eyeball in high degrees of myopia must either result in a tendency to detach the retina immediately surrounding the foramen, or to stretch the nerve fibers distributing to those parts of the retina tightly over the scleral ring. Other details of a similar nature could be given. Those already cited, however, are sufficient to show that it is vitally important to acquire a technique in the study of the blind spot which will give the precision and reproducibility of results needed for its successful use in checking up the advance or recession of a pathological condition and for diagnosis.

In general two types of method are available for determining the condition of a sense organ—the direct or objective examination and the functional test. The determination of the limits of the blind spot belongs to the latter type of examination. It may not be out of place, therefore, to note here some of the advantages of the functional test over any objective method of making the examination.

(1) As a rule, or at least in the greater number of cases, in the development of pathological conditions functional disturbances precede detectable structural changes in the fundus. An earlier diagnosis is thus rendered probable by the subjective method of examination. The hope of successful treatment rests upon an early diagnosis.

(2) A more minute search can be made by the subjective than by the objective methods of examination. It is obvious that the minuteness of examination by the subjective methods is limited only by the threshold of space discrimination.

(3) Pathological disturbances posterior to the fundus, of a kind or of a magnitude that does not produce a visible change of structure in the fundus, cannot be detected by the objective methods of examination. There is a possibility that by the subjective methods many of these can be detected at an earlier stage in their development and all of them at some stage in their development.

(4) Results by the subjective methods of examination are more or less amenable to numerical treatment and comparison.

It is obvious that there is great need to develop the possibilities of the functional test as a means of differential study and diagnosis. A sensitive and precise means of early diagnosis is, it scarcely need be pointed out, one of the most important adjuncts of preventive medicine.

logical conditions than the blind spot for achromatic stimuli, and the effect comes earlier in the course of the disease. (b) The variable factors are more numerous and have greater effect in case of the color blind spot. Writing on the latter point, Berens[3] says: "The use of colored test objects for outlining the blind spot has given such varying results, particularly when the illumination is not constant, that it is not used as a part of clinic routine".

Table 1

BLIND SPOTS FOR ACHROMATIC AND CHROMATIC STIMULI: AREA IN SQUARE CENTIMETERS

Stimulus	White	Black	Red			Blue			Green		
Background	Black	White	Gray	Black	White	Gray	Black	White	Gray	Black	White
Case 1	11.2	11.6	13.2	13.8	13.5	12.1	12.6	20.0	11.9	14.6	25.0
Case 2	11.0	13.0	16.2	15.5	22.5	14.0	14.1	20.7	14.6	16.2	22.8
Case 3	6.0	7.8	10.9	13.3	14.6	12.0	11.0	19.8	9.9	27.3	20.7
Case 4	5.7	9.7	16.2	20.2	19.0	13.3	17.6	23.5	12.2	16.3	17.5
Case 5	7.1	6.7	7.1	10.5	11.9	10.1	9.9	13.5	8.0	10.5	16.2
Case 6	7.2	7.0	7.3	9.9	8.7	8.7	11.3	9.3	8.7	8.4	12.7
Case 7	10.0	7.4	15.2	11.4	12.6	14.5	11.6	23.8	20.2	13.1	30.8
Case 8	11.6	10.0	11.0	13.0	15.2	11.8	13.0	14.2	14.3	15.8	16.3
Case 9	7.2	9.0	12.3	13.5	16.9	13.0	12.4	16.3	11.6	13.0	17.9
Case 10	7.3	8.4	9.6	10.4	10.3	8.9	10.2	17.1	11.4	9.3	16.7
Average*	8.43	9.06	11.90	13.15	14.52	11.84	12.37	17.82	12.22	14.45	19.56
Median	7.85	8.70	11.65	13.15	14.05	12.05	12.00	18.45	11.75	13.85	17.70

* By average in this and the following tables is meant the arithmetic mean, obtained by dividing the sum of the values by the number of cases. Because of the small number of cases the median value is also given.

The study of the size and shape of the blind spot presents many points of similarity to the study of the size and shape of the field for achromatic and chromatic stimuli. In the case of the field of vision for achromatic stimuli it has been found that the number of variable factors which affect the results of a determination is not nearly so great nor their control so important as for the color fields. This is true also of the determination of the size and shape of the blind spot for achromatic as compared with chromatic stimuli. The need for making a study of the factors which affect the determination of the blind spot for color and of securing in general a better technique for making this determination is twofold. (a) The blind spot for chromatic stimuli is apparently more affected by patho-

The following factors have been found to affect the determination of the color fields: wave-length and purity of stimulus, intensity of stimulus, size or visual angle of stimulus, length of exposure of the eye, method of exposure (moving or stationary stimulus), method of approach (ascending or descending series), intensity of general illumination of the retina and its state of adaptation, breadth of pupil, and brightness of preexposure and of background or surrounding field. Still other factors tend to make the size and shape of the fields differ from eye to eye. Some of these are age, curvature of cornea, errors of refraction for the central and for the peripheral field, acuity of the peripheral field, breadth of pupil, shape of face, sensitivity of the retina, and distribution of sensitivity over the reti-

na. All of these, with perhaps the exception of shape of face, are possible factors affecting the determination of the size and shape of the blind spot for color.

It is the purpose of the present study to show briefly the influence of one of the variable factors on the size and shape of the blind spot for color, namely, the brightness of the surrounding field or the background on which the investigation is made. In blind spot determinations, it may be noted that brightness of surrounding field serves also as brightness of preexposure, that is, the blind spot is usually mapped with a moving stimulus.

Conditions under which the work was done: The experimental work was done with the Ferree-Rand perimeter. The special features of this instrument which are of particular value for blind spot study are the provisions for control of intensity and color of light and for securing evenness of illumination; the devices and adjustments for the accurate location of the eye at the center of the perimetric system and for securing steady and precise control of fixation; and the special attachments for blind spot work providing for control of brightness of the preexposure and surrounding field and other variable factors.

One of these attachments consists of a special carrier in which may be inserted as desired the specially prepared paper screens on which the blind spot is to be mapped. These screens are larger than those used for the background for the stimulus in field taking, and extend farther below than above the center of the perimeter arc to accord with the location of the blind spot with reference to the horizontal meridian. These screens may be white, black, grays of the brightness of the color, and so on, as the needs of the work may require. On each screen are stamped twenty-four equally spaced lines radiating from the center outward. These lines serve as guides for movement of the stimulus in determining the limits of the blind spot, or when checking up the location of the limit by a second or third determination. After the determination these screens may be removed and filed as a permanent record, or the outline of the blind spot transcribed.

In using this attachment for mapping the blind spot, the perimeter arc is turned into the horizontal meridian and the carrier is moved along the arc until its center coincides with the center of the blind spot. The center of the blind spot is located for a given eye by determining the nasal and temporal limits for an achromatic stimulus, white on black or black on white, and finding the point midway between these limits the degree of eccentricity of which can be read on the perimeter arc. In centering the carrier, the pointer attached to the back of the carrier midway between its right and left edges is moved to this degree value on the perimeter arc.

Table 2

BLIND SPOTS FOR CHROMATIC STIMULI: COMPARISON IN SQUARE CENTIMETERS AND PERCENT OF THE SIZE WHEN DETERMINED ON BACKGROUNDS OF WHITE, OF BLACK, AND OF GRAY OF THE BRIGHTNESS OF THE COLOR. (AVERAGE OF TEN OBSERVERS)

Stimulus	Average area (sq. cm.)			Difference for black and white as compared with gray background			
				(sq. cm.)		(percent)	
	Gray background	Black background	White background	Black background	White background	Black background	White background
Red	11.90	13.15	14.52	1.25	2.62	10.5	22.0
Blue	11.84	12.37	17.82	0.53	5.98	4.5	50.5
Green	12.28	14.45	19.56	2.17	7.28	17.7	59.3

In determining the limit of the blind spot in any meridian, the stimulus is passed along that meridian toward the insensitive area until the observer reports its disappearance. Its direction is then reversed until it reappears. The points of disappearance and reappearance should coincide for an accurate observer. In case of the present study, when they were not found to coincide the average value was taken after several observations, provided that the distance between the points was less than the breadth of the stimulus. It may be noted in this connection that it was necessary to take the average of the points of disappearance and reappearance in case of only a very few observers. After a little practice the percentage of error of most of the observers was very low indeed.

The stimuli employed were small discs 2.5 mm. in diameter, cut by means of a special punch. These stimuli subtended a visual angle of 26 minutes or 0.43 degree at the eye 33 cm. distant. The chromatic stimuli were obtained from the Heidelberg papers, red, blue, and green; the achromatic stimili from the Hering white and black papers (coefficients of reflection respectively 78 and 4 percent). For convenience of use these stimuli were mounted at the ends of slender metal rods painted to match in brightness the screen being used. The perimeter and the table on which it was mounted were painted midgray to avoid extremes of brightness preexposure during the rest periods and the preliminary period of adaptation.

White, black, and grays of the brightness of the color as seen on the edges

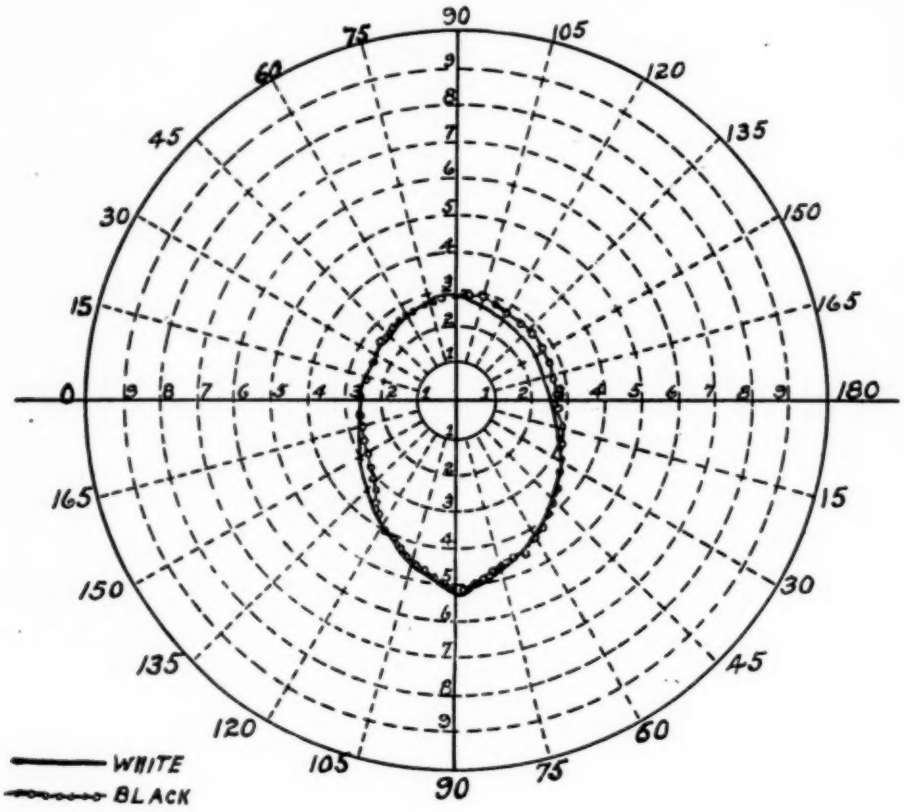

Fig. 1. Average blind spot for a white stimulus on a black background and a black stimulus on a white background (coefficients of reflection respectively 78 and 4 percent). Average of ten observers.

of the blind spot were used as backgrounds on which to make the determination. These were taken from the Hering series of standard papers. The gray used for the red and blue stimuli was number eleven of this series, coefficient of reflection twenty-four percent; and the gray for the green stimulus was number six, coefficient of reflection forty-two percent.

In most instances it was impossible to obtain at a single sitting a complete set of maps between which comparisons were wanted. To guard against comparisons being made between results obtained with the eye in a different state of sensitivity, the work done at a previous period was always adequately rechecked, the criterion being that the results obtained at different sittings must

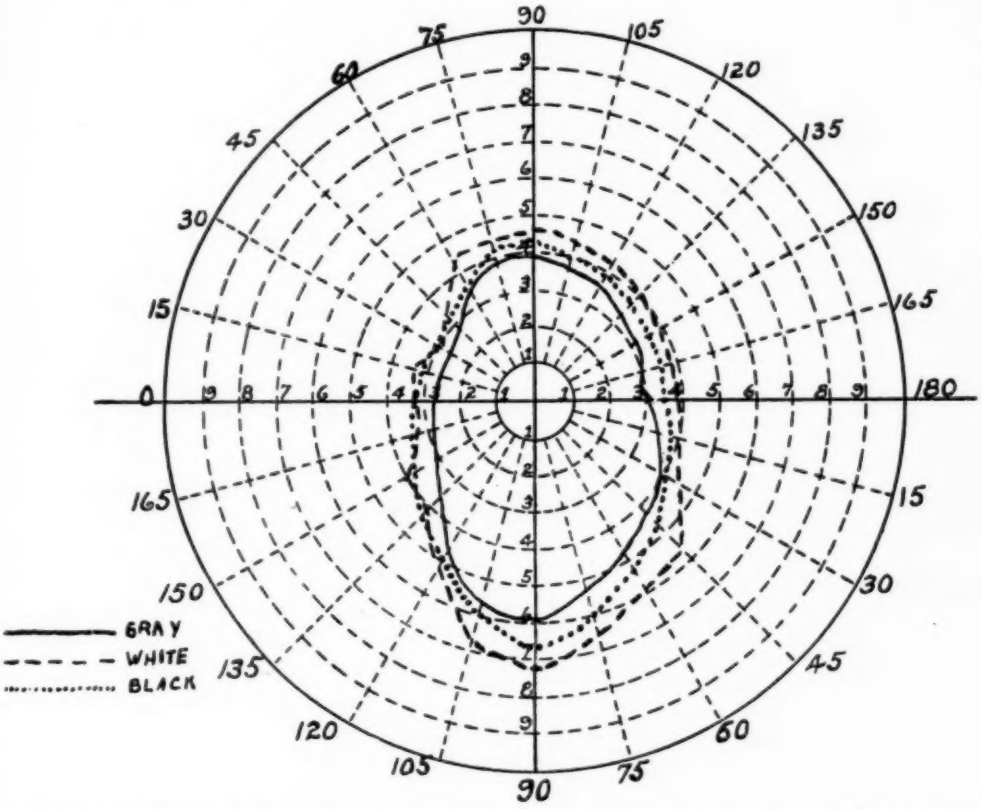

Fig. 2. Average blind spot for a red stimulus on backgrounds of white, of black, and of gray of the brightness of the color (average of ten observers).

The intensity of illumination of the perimeter arc and blind spot screen was kept constant at seven foot-candles. Constancy of illumination was secured by ammeter and rheostat control of the current operating the lamp used to illuminate the arc of the perimeter. At the beginning of each working period the sensitivity of the eye of the observer was standardized by a twenty-minute period of adaptation to the illumination used.

fall within the same limit of error as those obtained at a single sitting.

Results: A detailed statement of results is contained in tables 1 and 2 and a graphic representation in the accompanying maps, figures 1 to 4.

The areas of the blind spots for the different stimuli and conditions employed are given in table 1. These areas were measured by means of a planimeter. They represent the size of the blind spot at a distance of 33 cm. The

advantages of measuring the area for comparative purposes is obvious. Only a rough knowledge of comparative sizes can be had from the inspection of the plotted graph or map of this area.

This statement applies to the treatment of the results for all types of field study. As already noted in a previous section, if a comparison is to be made with the minuteness and precision needed both for laboratory and diagnostic purposes, a single value or index must be had which can be taken as fairly representative of the retinal areas under investigation. In case of the blind spot no more accurate and convenient index of the actual extent of the insensitive area can be found, perhaps, than the area of the plotted graph, provided that the limits of sensitivity have been determined and plotted in a sufficient number of radial lines. The measurement of this area by means of a planimeter is extremely quick and simple.

In table 2 are shown the areas of the average blind spot for the red, blue and green stimuli on each of the three backgrounds, and the difference, expressed both in square centimeters and percent, of these areas mapped on black and white as compared with those mapped on backgrounds of the gray of the brightness of the color.

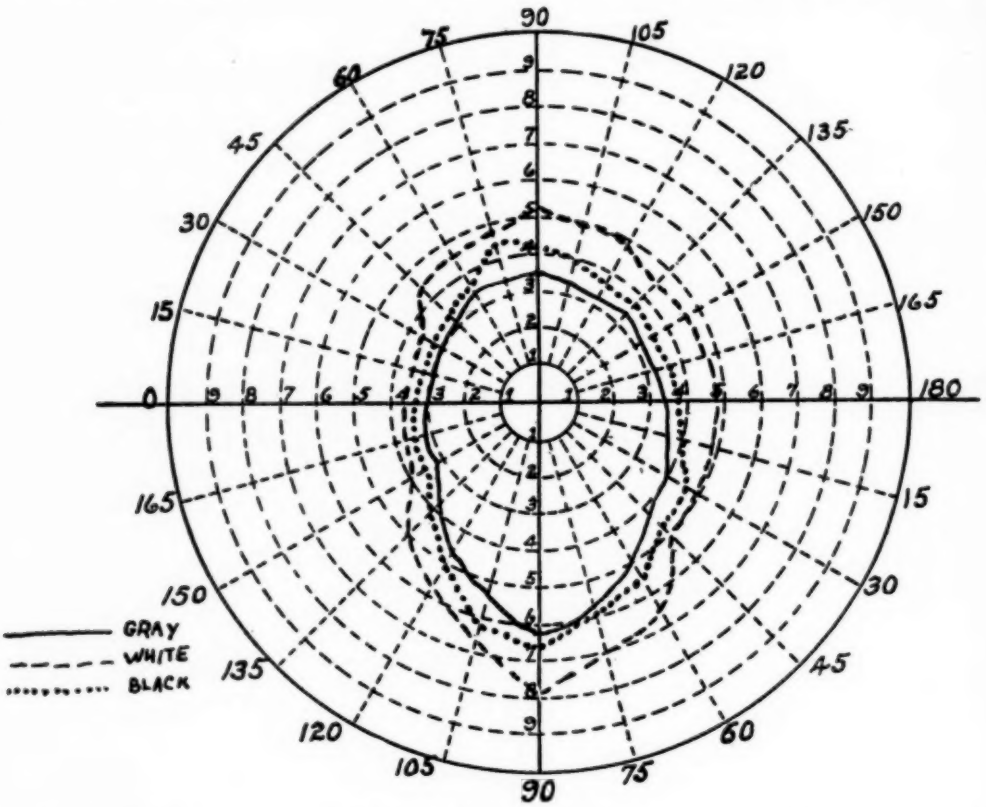

Fig. 3. Average blind spot for a green stimulus on backgrounds of white, of black, and of gray of the brightness of the color (average of ten observers).

The results obtained may be summarized as follows:

(1) The average distance of the center of the blind spot from the center of the field of vision for the achromatic and chromatic stimuli was 16.5 degrees. The range was 14.5 to 17.5 degrees.

(2) The blind spot for an achromatic stimulus averages 7.6 percent larger on a white than on a black field. That is,

black on white gives a slightly larger blind spot than white on black. This difference is in the direction that might be expected. (a) The influence of the irradiation of the white excitation on the retina would tend to increase the area stimulated in case of the white stimulus on the black field and to decrease it in case of the black stimulus the chief reason for the smaller blind spot for white on black. That no more effect of the factor on the size of the blind spot is found, is due to the steepness of the sensitivity gradient around the blind spot.

(3) The blind spots for the chromatic stimuli were all much larger than for the achromatic stimuli. The difference

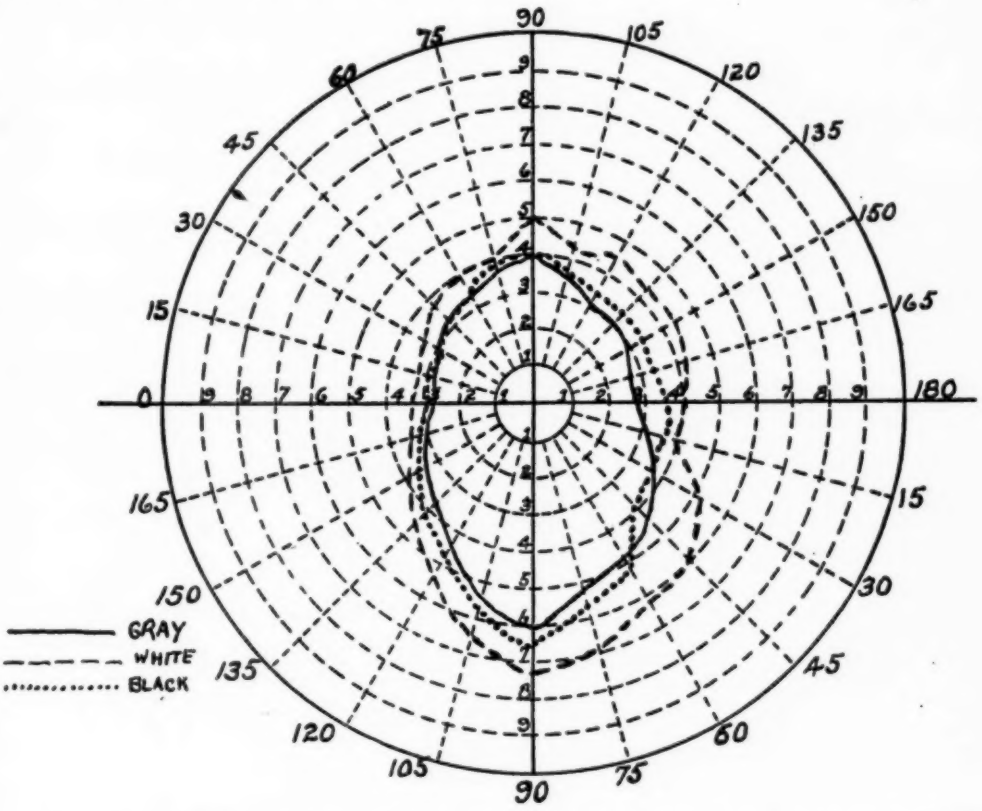

Fig. 4. Average blind spot for a blue stimulus on backgrounds of white, of black and of gray of the brightness of the color (average of ten observers).

on the white field. Probably because of this, too, a white stimulus on a black field always appears larger than a black stimulus of equal size on a white field. (b) The sensation difference for white on black is greater than for black on white, due probably to a difference in physiological induction in the two cases. In a former paper[4] two of the writers have shown that this difference is quite considerable and varies with the intensity of the illumination. The higher visibility due to this factor is probably is so great as to leave no doubt as to the conclusion that should be drawn. On the gray of the brightness of the color they averaged 40 to 45 percent larger than those for the achromatic stimuli; on the black field 47 to 71 percent larger; and on the white field 72 to 132 percent larger.

(4) The average blind spot for chromatic stimuli was smallest when the surrounding field was of the same brightness as the color. Depending upon the color of stimulus employed,

it was 5 to 18 percent larger on a black surrounding field and 22 to 60 percent larger on a white surrounding field.

(5) Not only the average size but the order of ranking as to average size varied with the surrounding field. From largest to smallest the order for the white field is green, blue, and red; for the gray of the brightness of the color and for the black field the order was green, red, and blue.

(6) The average deviation in size of the blind spots for chromatic stimuli for the different observers was smallest on a background of the brightness of the color for blue and green, and on a black background for red. The deviation was largest on a white background. Compared with the smallest average deviation obtained, namely, the deviation for blue and green on a gray of the brightness of the color and for red on black, it was 41, 72, and 138 percent greater respectively for the red, green, and blue stimuli.

(7) The difference in the size of the blind spots for blue and green on a white surrounding field, as compared with their size on a field of the brightness of the color, was three to four times the average deviation for the different observers when a field of the brightness of the color was used, and twice the average deviation when the surrounding field was white. The difference in the size of the blind spots for red on a white surrounding field, and for red, blue, and green on a black surrounding field, as compared with the size on a field of the brightness of the color, was approximately equal to or slightly smaller than the smallest average deviation obtained.

(8) There was no consistent difference in the effect of brightness of surrounding field on the nasal, temporal, upper, and lower limits of the blind spots for chromatic stimuli from observer to observer. A differential effect did occur, however, in the case of any given observer.

(9) The blind spots for color were the most regular in shape on a background of the brightness of the color, and the most irregular on a white background.

(10) Other points affected by the brightness of the background were the order of ranking as to size for the different colors from observer to observer, the interlacing of the limits for the different colors, and the hue changes on passing into the scotoma.

As in the determination of the color fields, when a background of the brightness of the color is used the color disappears completely into the background when the limit of color sensitivity is reached, instead of appearing as a gray concerning the colorlessness of which the observer may be in doubt. This gives the same effect as the disappearance type of photometer, and, like it, adds greatly to the ease and precision of making the judgment—a feature of very great importance in case of inexperienced and unintelligent observers.

On all the points of importance to a satisfactory technique, gray of the brightness of the color as background gave the best and white the worst results. There can be little doubt that it is almost if not quite as important to use a gray of the brightness of the color as surrounding field for blind spot determination as it is for the determination of the color fields.

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PHLYCTENULOSIS AND ITS RELATION TO TUBERCULOSIS

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The most important factor in the production of phlyctenulosis is improper diet; and the most successful remedies are modification of diet, fractional doses of calomel, and the instillation of atropin solution. The author found it possible at will to produce recurrence and disappearance of phlyctenular attacks by resort to incorrect or correct dietetic methods. This is regarded as inconsistent with the belief that phlyctenulosis is intimately related to tuberculosis infection or tuberculous toxemia. Read before the Chicago Tuberculosis Society, January 10, 1929.

My renewed interest in the relation of tuberculosis to ophthalmology is the result of my comparatively recent association with the Municipal Tuberculosis Sanatorium of Chicago. Since that time I have had the opportunity of observing a great many cases of tuberculosis of various types and stages, some very toxic and others apparently presenting the picture of perfect health, in both the young and the aged. I have had the further advantage of observing the work being done in the research laboratories and of discussing with the laboratory workers the different problems involved. As a result I have found no reason either to retract or to make any radical changes in the papers published some twelve years ago on the subject of phlyctenulosis and its etiology[1].

The reports at that time were the result of observations based on upward of one thousand cases. Since then I have had the opportunity of seeing a great many of these children grown to adult life without disclosing any evidence of tuberculosis other than could be expected of a similar group that had been subjected to the usual diseases of childhood.

The deductions made and the therapy instituted at that time have not been materially altered, and only in so far as our newer knowledge of food values has developed.

The theory still adhered to by some is that this disease is due to the tubercle bacillus or its toxins, regardless of the fact that the organism or tubercle formation has never been demonstrated in these eyes, nor has it been possible so far to reproduce the disease or anything like it by any method which might be regarded as analogous to that in the human being. The tuberculous idea is founded almost wholly on the facts that these children presented a so-called strumous diathesis and a positive Pirquet reaction, and that the etiology was unknown. As a matter of fact some of the most resistant cases I had to deal with were in children quite the opposite of the so-called strumous type.

Some years previous to my intensive interest in this subject, my chief (W. H. Wilder) was subjecting these patients to instillations of minute doses of tuberculin in the affected eye, and others were receiving this medicament subcutaneously. I assisted in some of this work and later carried it on. I was neither impressed with the results obtained nor with the theory upon which the work was based. The symptoms were not controlled rapidly, and the treatment had to be carried on in most cases for many months before results were obtained.

At that time I felt, as I still do, that cases so treated would receive just as much benefit if the therapy were limited to the local use of atropin. However, attempts to reproduce the Pirquet reaction by solutions made after the tuberculin formula, with replacement of the tubercle bacillus by other organisms, failed to give a similar reaction. The organisms used at different times for this experimental work were staphylococcus, colon bacillus, pneumococcus, Klebs-Loeffler bacillus, and streptococcus, each one

[1] The pathogenesis of ophthalmia eczematosa, Jour. Amer. Med. Assoc., July 14, 1917.
The pathogenesis of ophthalmia eczematosa, Illinois Med. Jour., Nov., 1918.

being used separately with controls.

It has been clearly shown that tuberculin does possess specificity, but just what that specificity means is still an open question. It surely does not mean that a disease for which the etiology is unknown, in a patient whose skin reaction is positive, must be attributed to this sole basis. I followed up this idea with about two hundred cases of various types as they came into the clinic, but excluded phlyctenular disease, and I found what is now generally known, that the percentage of positive reactions was about the same.

Our material at that time was very abundant, and, in view of the fact that one form of treatment seemed as efficacious as another, tuberculin included, I decided to ignore the tuberculous theory entirely and to adopt routine measures that might lead to some information of value. Each case was subjected to a general physical and ophthalmic examination, and series of cases were placed under various forms of treatment that were popular at the time or of any known value.

After some months we could definitely say that of all the drugs used locally by instillation or application in the form of an ointment, atropin sulphate yielded the best results. All other drugs (and many have been used) were of about equal value.

This was followed by series of cases in which internal medication only was administered; here we found calomel in minute doses to be of the greatest value. We therefore arrived at the stage at which we could definitely say that of all the drugs, vaccines (tuberculin included), surgery, and other methods used in the control of this disease, atropin sulphate locally and calomel internally produced the most uniform results. This combination seemed much more efficient than the use of either drug alone in an individual case.

In the preparation of this paper I came across a tabulation of 241 cases which is interesting from the age standpoint. The period between the ages of two and six years accounted for fifty percent of the cases, and extending the age limit to thirteen years accounted for seventy-eight percent. Six cases were under two years of age, and there were forty-one cases between the ages of fourteen and fifty-three, indicating that this disease is not limited to childhood.

The value of calomel internally gave rise to the question of the part played by diet in these cases. An investigation along this line showed that the great majority of these children were from the so-called lower classes, where the families were large, but supervision almost none. Information elicited from parents, visiting nurses, welfare workers, and so on indicated that the food was neither deficient nor bad; the same could be said of the housing factors. It was found that, left to their own desires and tastes, the children favored the consumption of an excessive amount of carbohydrates, especially in the form of sweets, to the degree that a desire for plain nutritious food was badly disturbed, which would appear quite natural under the conditions. The adoption of a dietary routine as the only form of systemic control, and the use of atropin locally, gave us still better results.

A series of cases was now subjected to the following test: Cases in which the eye symptoms were clinically cured, that is, the eyes were white, photophobia and blepharospasm absent, were again placed on a diet rich in sweets. The results were emphatic. The phlyctenule reappeared, and with it all the symptoms of the disease. Where the phlyctenular symptoms had been absent for a long time the precipitation of the attack required a longer period; where the symptoms were very recent they were reproduced very rapidly. This experiment could be carried out as often and as frequently as we wished.

Another experiment was interesting. Instead of placing these cured cases on natural sweets we substituted synthetic saccharin first in small doses and then in larger doses, but could not precipitate the symptoms. These experiments

were reproduced so often, many times for the benefit of those interested in the work, that the parents soon grasped the idea and refused to permit their children to return to their former diet.

At that time our deduction as to the results obtained, and as to the part played by excessive consumption of carbohydrates in the form of sweets, was as follows: "Whether the unfavorable influence of carbohydrates is to be ascribed to a faulty metabolism, or to a limited ability of assimilation of the carbohydrates, and the excess undergoing chemic changes which in turn yield toxic or irritating agents sufficiently effective to produce eczematous manifestations, must for the present remain an open question".

This work was done long before present facts as to food values, concerning vitamins and so on, were common knowledge, especially in relation to ophthalmology. Some very unique case reports, particularly in the adult form, could be cited, but space will not warrant.

Résumé as to the present status of the tuberculosis idea

I am now more convinced than I was in 1918 that no direct relation exists between this disease and tuberculosis. That a child having tuberculosis may have phlyctenulosis I quite realize, and likewise inversely. That a true phlyctenule has never been produced in animal experimentation I am also quite sure, at least I can say that in all such animals that I have seen, or of which I have read, in which occurred lesions so described, the lesions never resembled the phlyctenule in its pure state as seen in the human being. The authors of these experiments do describe a deep infiltrating keratitis or a destructive corneal ulcer. But in no case, to my knowledge, has the tubercle bacillus or a tubercle formation, with its area of caseation, epithelioid zone, giant cells, and so on, ever been seen or demonstrated in a phlyctenule, nor has a true phlyctenule ever been produced experimentally.

As to the theory of a tuberculous toxemia being the cause of phlytenules, I can only say that among the many cases of tuberculous toxemia that I have had the opportunity of seeing, I did not find one typical case of phlyctenule formation. I can further say positively that among the type of case seen at the Illinois Charitable Eye and Ear Infirmary or the Municipal Tuberculosis Sanatorium of Chicago, it is very rare to see a child with the most severe case of phlyctenulosis disclose the symptoms common in one suffering from a tuberculous toxemia.

Can we, then, say that a child suffering from a proved tuberculosis, with temperature, sweats, and so on, does not present a tuberculous toxemia, or must we say that a child with an eye disease which is associated with a positive skin reaction and none of these symptoms does present a tuberculous toxemia?

Supposing for the moment that phlyctenulosis were due to the tubercle bacillus or its toxins, when has it been demonstrated that we could clear up cases due to these factors in ten days or frequently less, and very severe cases in a month or so? Or that a condition due to the tubercle bacillus could be corrected with a slight alteration in diet and a little atropin? Furthermore, would it be possible to clear up such symptoms and precipitate them again and again at will by dietetic measures, if we were dealing with a tuberculous phenomenon?

Therefore, upon what grounds can we attribute this group of symptoms to tuberculosis? The eczematous manifestations are not common to tuberculosis, nor is the extreme dryness of the hair or the seborrhea due to this disease. The adenopathy might be so considered, but cannot this be more easily accounted for as resulting from diseased tonsils, adenoids, bad teeth, and infected eczematous patches on the head and neck? Of the many cases for which temperature charts were recorded, none disclosed the characteristic afternoon rise.

The Pirquet reaction, after the second year of life, may or may not mean anything definite so far as this disease is concerned. At the present time we do not know just what tuberculin is, but those interested in this subject will find a very extensive literature on this phase of the question which seems to indicate that the so-called focal reaction as exhibited by the use of tuberculin can be reproduced with other substances.

The influence of diet on the so-called strumous type of children was well demonstrated to us some years ago. The sisters from the Bohemian Orphan Asylum at Lisle, Illinois, were in the habit of bringing children to the Illinois Eye and Ear Infirmary with various eye diseases, among which we saw a number of cases of phlyctenulosis. Inquiry disclosed the information that most of the children in this institution had skin disease on some part of the body, and some had eye disease.

Dr. Arthur Hunneman, of the Illinois Eye and Ear Infirmary, and myself made an examination of 287 of these children, ranging about from four to fourteen years of age. Every one of them had some eczematous manifestation, the degree varying with the length of time the child had been in the institution and its general vitality. If a child left the institution for a time and returned, the skin lesions usually had disappeared, but in a very short time these lesions would recur.

We were present during their midday meal. The food was heaped upon the table, it was good and plentiful, but there was no supervision. That is, the children could have what they wished. We instructed the sisters to send us a complete detailed list of everything served every day for one week. This diet list showed that a butter substitute was used. We suggested the use of real butter and more careful supervision of what each child consumed. About two months later we received a report that every case was better, and most of them cleared up entirely.

The criticism at that time, from those familiar with the work, was not directed at the results obtained, but was to the effect that I had not proved my case experimentally. This was true to the extent that I had proved nothing except from a clinical standpoint. I could not produce the disease in an individual not susceptible to this disease, but where the disease was present I could clear up all the symptoms and could again precipitate the symptoms at will, and I could repeat this experiment as often as desired.

Tuberculosis is under much better control today than it was ten years ago, but it is far from being reduced to the comparative rarity of the prevalence of phlyctenulosis today. Up to 1918 I had at all times from fifteen to twenty-five cases under constant observation; today I do not average more than one or two cases a month.

In the past year or more I have seen a few such cases at the Municipal Tuberculosis Sanatorium, referred here by large teaching institutions. In none of these cases has there been demonstrated one sign or symptom of tuberculosis, other than a positive Pirquet reaction. We have kept these cases under observation for a short time, treated them, and discharged them.

How may we account for the very marked reduction in the prevalence of phlyctenular disease today? This is not difficult if we look about us and recognize what is being done and has been done in the past fifteen years in the way of educating the general public.

The wide medical publicity by the lay press, infant welfare organizations, health departments, visiting nurses, health columns, and so on concerning proper care of the infant in the first year of life, concerning dietary supervision as advocated by the pediatrician, and concerning the influence of food values and hygiene in relation to the development of disease, have contributed greatly to bring about this more enlightened point of view.

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WILLIAM HENRY CARMALT

The growth of ophthalmology

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Carmalt, last survivor of the original members of the American Ophthalmological Society, was among the earlier ophthalmologists who continued to be also general surgeons. His career is illustrative of the relatively recent trend toward specialization in medicine and surgery, and also suggests some lessons as to the contacts and relationships between the larger and the more limited fields of observation and practice.

Dr. William H. Carmalt was born August 3, 1836; and died July 17, 1929. He was the last survivor of the original members of the American Ophthalmological Society, organized in 1864. After studying engineering at Yale for a year, he spent two years at the medical school of the Doctors Wyman at Cambridge, Massachusetts, and then became a private pupil of Dr. John C. Dalton, professor of physiology in the College of Physicians and Surgeons in New York City, where he received his M.D. in 1861. He served as surgeon in the Civil War. Returning to New York he became assistant, and later surgeon, to the New York Eye Infirmary.

In 1859, as commissioner of the New York State Agricultural Society, he published his first paper, on abortion in cows. In 1870 he went to Europe, remaining until 1874, studying in Vienna, Breslau, Strasbourg, and Paris. In 1876 he removed to New Haven and entered on special ophthalmic practice. In 1881 he was appointed professor of principles and practice of surgery, a position he held until 1907. In 1885 he became a member of the American Surgical Association, and in 1907 its president. With the organization of the Congress of American Physicians and Surgeons he was made its secretary, and this position he continued to fill from 1888 to 1910, during which time the Congress reached its greatest prominence and usefulness.

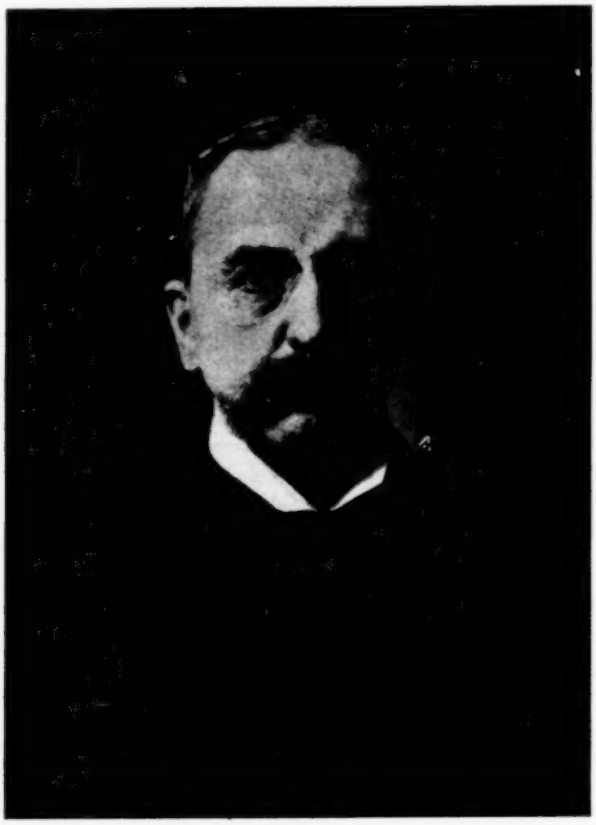
Of Dr. Carmalt's thirty-eight published writings (as given in the biographical sketch prepared by Dr. John E. Lane, from which some of the important facts here mentioned are obtained), nine papers dealt with subjects belonging to ophthalmology, four having been read before the American Ophthalmological Society, one before the American Surgical Association, and one on "specialism in medicine" being his president's address before the Connecticut State Medical Society. His interests continued broad throughout the fifty years he devoted largely to special practice. He read before the Connecticut State Medical Society a paper on "heredity and crime, a study in eugenics"; and his last paper, published in 1926, reviewed the history of "the second half-century of the General Hospital Society of Connecticut".

When Dr. Carmalt received his medical degree, very few reputable members of the medical profession had taken up ophthalmic practice as a specialty. Henry W. Williams of Boston studied ophthalmology at Paris, Vienna, and London three years before he graduated at Harvard in 1849; and in 1850 he showed his interest in it by teaching a class of students. But it was 1869 before he was made lecturer in ophthalmology in Harvard, and 1871 before he was given the title of professor. Elkanah Williams went to Europe to study surgery. But he was diverted to ophthalmology, which he studied in Paris, London, Berlin, Prague, and Vienna; and he never gave up his interest in general medicine. In New York Henry D. Noyes had returned from Europe in 1859, and had engaged in special practice, reporting his first ophthalmoscopic cases in 1860. In Philadelphia Isaac Hays, who gave most of his life to editing the American Journal of Medical Sciences, and Squire Littell, who in 1837 had published a manual of diseases of the eye, were

surgeons to Wills Eye Hospital from its opening in 1834, and undertook ophthalmic practice.

All these had given some attention to otology. Herman Knapp, four years older than Dr. Carmalt, came to New York in 1868 and founded the New York Ophthalmic and Aural Institute. When the American Ophthalmological Society had been meeting for two years its members formed the American Otological Society, which for many years met at the same place as, but the day before, the American Ophthalmological Society. It was as a representative of the American Otological Society that Dr. Carmalt was chosen secretary of the Congress of American Physicians and Surgeons, formed by the coming together of the American special societies.

Dr. Carmalt's life covered the period of the specialization of ophthalmology; but he did not pass from the general practice of medicine and surgery into special practice, as did most of his confrères. He became assistant to the New York Eye and Ear Infirmary in 1863, two years after he graduated, and was appointed a surgeon, resigning in 1870.



William Henry Carmalt

As already mentioned, it was in 1876 that he was made lecturer, and in 1879 professor of ophthalmology and otology at Yale; while in 1881 he received the title of professor of principles and practice of surgery in the medical school of that university. In Philadelphia, before Thomson, Strawbridge, Harlan, and Norris were appointed surgeons to Wills Hospital, its clinics were in the hands of four surgeons, who each had a general surgical service in the Penn-

sylvania Hospital. When Dr. Carmalt graduated, every surgeon at the Royal London Ophthalmic Hospital at Moorfields was a general surgeon. When the American Ophthalmological Society was organized, its first meeting was called to order by Dr. F. J. Bumstead, best known in connection with genito-urinary surgery; and its first president—holding the office four years—was Edward Delafield, who, although associated with the organization of the New York Eye and Ear Infirmary, was better known for his work in obstetrics and pediatrics. At that time the workers at Moorfields, from Sir William Bowman to Jonathan Hutchinson, were all classed as general surgeons. Except in the minds of a few individuals, no specialty had yet proclaimed its existence in the widening field of medicine.

The enormous development of specialties that has occurred since that time has been forced by the growth of knowledge, both of the scientific basis of medicine and of the sciences that contribute to it. In biology, evolution was the Rosetta Stone that interpreted all that had been observed before. The theory of conservation of energy, electromagnetism, chemistry, optics, poured out new facts that had to be understood and utilized. Helmholtz gave the ophthalmoscope, Graefe operative and diagnostic technique, Donders opened a field of ophthalmic practice greater than had been known before; and a host of workers discovered lesions, symptoms, and relations that had not been suspected.

But it is not only those who discovered new facts in ophthalmology who are to be honored and remembered. Those who like Dr. Carmalt maintained a broad interest in the wider fields of medicine and surgery have helped to keep their special branches of medicine sound, progressive, and ethical. Beyond this, such workers in ophthalmology have rendered this specialty more efficient in its own field of ocular conditions, and more important in its cooperation with other branches of medicine. The practical bent of the British physician produced most striking results among those who learned ophthalmology in London. The "Medical Ophthalmoscopy" of Sir Clifford Allbutt turned the attention of both ophthalmologists and physicians to this field, which is still comparatively little known and little cultivated. J. Hughlings Jackson, because of his mastery of the ophthalmoscope, could put the knowledge of cerebral disease on a new basis, Sir William Gowers showed the necessity of the ophthalmoscope in the diagnosis of disease of the central nervous system and the importance of the connection between neurologic and ophthalmic diagnosis. Sir Jonathan Hutchinson achieved permanent fame both as a syphilographer and as an ophthalmologist, when he called attention to the etiology of interstitial keratitis.

When Edward Nettleship had retired from practice, his broad interest in heredity led him to study the Coppock family, affected by a peculiar form of cataract which has been called by that family name, or is known as the Doyne cataract for the name of the observer who first drew attention to it. Nettleship went on studying other forms of familial cataract and glaucoma. Then hereditary night-blindness as observed in a French family was traced back more than two hundred years, with the help of a French priest and the parish registers. By Nettleship's work, ophthalmology was placed in the lead of other branches of medicine in the study of heredity; and he was honored by a special volume of the publications of the Galton Eugenics Laboratory. Marcus Gunn's observation and exhibition of the changes in the retinal vessels associated with arteriosclerosis, as his observations became appreciated, confirmed, and supplemented by others, have added to the value and importance of every ophthalmoscopic examination of a patient past middle life.

During the World War the announcement of the spirochete causing epidemic jaundice and its uveal lesions, that had been studied in Japan, became serviceable to the Army surgeons on

the western front, who had a broad interest in medicine, and believed that something new could be learned outside of Germany, even about "Weil's disease". The changes in the optic disc and retina with "trench fever" and after head wounds were utilized by those who were awake to the broad significance of eye symptoms. The same is true regarding the new knowledge of visual field changes after head injuries. The discovery of insulin changed the prognosis of eye conditions attending diabetes. A wider knowledge of calcium metabolism and the function of the parathyroids may throw a new light on the etiology of cataract. It is likely that the missing links in our knowledge of glaucoma may be supplied by study of the physiology of the circulation and researches in biochemistry.

There were specialists in eye diseases in ancient Egypt, and traveling quacks that got recognition from royalty in medieval Europe, like Chevalier Taylor. But it was after trained physicians and surgeons, keeping their interest in general medicine and their standing in the medical profession, began to study and practice this special branch of medicine that modern ophthalmology came into existence. Dr. Carmalt, by keeping a broad interest in his profession, was able to attain a very high rank in his specialty, outside of any great medical center, and during what Treacher Collins has called "the Golden Age of ophthalmology". His balanced life may well be a landmark of medical history to guide those who are preparing for or entering upon ophthalmic practice as a specialty.

217 Imperial building.

GIUSEPPE CIRINCIONE

Leader of Italian ophthalmology

F. Park Lewis, M.D., F.A.C.S.
BUFFALO

Few men have played a greater part in modern Italian ophthalmology than Giuseppe Cirincione. From the special memorial issue of the Annali di Ottalmologia e Clinica Oculistica Dr. Lewis has compiled a readable account of this distinguished clinician and teacher.

The March, 1930, number of the "Annali di Ottalmologia e Clinica Oculistica" is devoted entirely to the life and memory of the celebrated Italian oculist Giuseppe Cirincione, who died on March 19, 1929, while on the way to his clinic on the Viale Castro Pretorio. The following brief biographical notes are chiefly drawn from eulogies written by Cirincione's friends and coworkers, Maggiore, De Michele, Ovio, and others.

When the activities of a great man are brought to a close his passing is a loss not only to his own country or guild but to the world at large. To spend weary hours in the laboratory, to suffer disappointment without discouragement, to maintain serenity and poise when most bitterly assailed, to rise superior to adversity and defeat when the energy of youth is gone, these are elements of greatness that encourage and stimulate the young followers of such a leader as Giuseppe Cirincione. Few men have lived so intense a life, few have shown such love of work and study.

His boyhood was spent on a farm at Bagheria near Palermo (Sicily). From the beginning of his classical studies he chose the medical profession for his career. He graduated with honors in 1889. At a period when scientific laboratories were meagerly endowed, he sacrificed not only the luxuries but even the necessities of life in order that he might acquire the reagents and animals necessary for study.

His great ability was quickly recognized by Armanni, who took the young man under his own guidance in order to instruct him in the technique of structural anatomy and pathology at a time when the more modern instruments had not yet come into existence and sections were still cut by hand. He was especially enthusiastic in his microscopic studies and in research, but more particularly his interest was in the eye and its adnexa. His classical studies on the lacrimal passages date back to this period. Just after receiving his medical degree, he presented to the Neopolitan Academy of Medicine a note claiming for the Italian Anatomist Fontana the discovery of the myelin sheath and cylinder which had been attributed to German workers. The Academy appointed a commission which after investigation found this claim to be perfectly justified.

Under the direction of Virchow he made what is said to have been the first comparative study of embryology of the eye, and in 1891 he won the His prize, offered by the Royal Academy of Medicine in Turin. In the His laboratory he met Spalteholz, with whom he collaborated in the latter's famous anatomical atlas. His great admiration for Professor His was reciprocal. His had an exaggerated prejudice against having his photograph taken. But he consented to pose for Cirincione, and thus was secured the only portrait ever obtained of the great histologist, and one which is now published in all of the treatises on anatomy.

An anecdote will indicate the struggle of these early days. To acquire materials for his research, Cirincione had reduced to the minimum his personal expenses. While awaiting a remittance from his family one day, there came to the laboratory a fresh embryonic specimen which his enthusiasm could not ignore. He bought it with his last penny and went that day without food. That evening he spent among the

monuments of the cemetery, and on one of them he wrote in pencil: "Here Giuseppe Cirincione knew the pangs of hunger."

He was appointed to the Ophthalmic Clinic of Naples. Under the guidance of the celebrated De Vincentiis, in 1894 Cirincione received the title of docent. In 1896 he was called to the Italian colony of Tunis as directing oculist of the Colonial Hospital, where he quickly achieved success because of his operative skill. He returned in 1898 to Palermo, where he founded a great institute for the treatment of the eyes which was noted not only for its clinical advantages but for the exceptional opportunities given to students.

GIUSEPPE CIRINCIONE, 1863 TO 1929

Among the many scientific works which he accomplished in his private institute may be mentioned those on silicious cataract, on ocular parasites, on palpebral elephantiasis, on retinitis in pregnancy, on resection of the eyeball, on blepharoplastic operations, and on the structure and pathology of the lacrimal passages.

In 1900, Cirincione founded "La Clinica Oculistica", a monthly periodical which, designed in the beginning for practical ophthalmologists, soon became a repository for scientific researches of the first order.

He was called from Siena in 1903 to the chair of ophthalmology at Genoa. From Genoa he went to Palermo, where he succeeded Angelucci. He remained in Palermo to the end of 1908, and introduced a course on trachoma which led to intensive teaching of the subject through the whole of Sicily. In 1908, on the death of Businelli, he received a unanimous call to the chair of ophthalmology at the University of Rome, the goal of all Italian teachers.

The clinic at Rome was in a state of disorganization owing to the long illness of Businelli. The apparatus had been neglected, there were few books, no laboratories, an out-patient clinic reduced to its lowest terms. After a few years, the Minister of Instruction cordially cooperating with Cirincione, the laboratory had been completely supplied with all the modern facilities and everything necessary for the most varied forms of research. The clinical lecture room soon became totally inadequate for its needs. There was room for only fifty students. Three hundred crowded its capacity. With great effort Cirincione succeeded in obtaining a new, splendidly equipped hall, and under his personal supervision it became one of the most beautiful and attractive in Rome. A very rich collection of autochromes of diseases of the eye, and of microscopic preparations, was developed in the course of years through the efforts of Cirincione and his personal assistants. This series is said to be equal to any in Europe.

With Cirincione, teaching was almost a passion. It was not unusual for him to stay in his laboratory with students until after midnight, studying the thousands of preparations and clinical photographs which they had developed.

He had spent the year 1898 in Paris at the Sorbonne with Tscherning, and he determined to make the laboratory at Rome one of the finest in the world. His clinic was one of the first to introduce the Gullstrand ophthalmoscope. But his most valuable addition to the ophthalmic department of the university was a magnificent series of colored

drawings of diseases of the eye, which were destined to serve in illustrating the atlas on which he had been working for many years. These plates carried the diseases through all their stages, in many instances correlated with the visual fields and other details sometimes leading to cure and sometimes to the final autopsy, with colored microscopic drawings of the pathological findings.*

He had founded the "Clinica Oculistica". During the World War, in 1917, it was merged with the "Annali di Ottalmologia" under the inclusive title of "Annali di Ottalmologia e Clinica Oculistica", a periodical which under Cirincione's editorship was issued in excellent style, admirably printed on fine paper, and freely illustrated with color drawings, a dignified journal worthy of the ophthalmologists of Italy. This combined journal is now under the able leadership of Professor Giuseppe Ovio, who has also succeeded Cirincione at the University of Rome.

The great ability of Cirincione as a teacher is shown in the vast number of teachers whom he himself taught. Five professorial chairs in different Italian universities are or have recently been held by his pupils. His nephew and beloved pupil, Professor Speciale Cirincione, of Turin University, died in January, 1929.

Fuchs has written of him: "Professor Cirincione was an indefatigable worker who contributed in an extraordinary degree to the progress of ophthalmology." Hirschberg placed him with De Vincentiis and Tartuferi as one of the three great leaders of ophthalmology in Italy.

Then, when his clinic had become the most noted in Italy and one of the finest in Europe, and his ambitions seemed to be almost fulfilled, the blow descended.

Like many other eminent professional men he had become active in political life. He had been elected as senator. He had also occupied important military posts during the war. Such a man can seldom go steadily forward without exciting antagonism. Whatever the reason, he was suddenly deprived of his professorship in the University to whose upbuilding he had so splendidly contributed. Like Carlyle when his only manuscript of "The French Revolution" was thrown in the fire through the carelessness of a maidservant, Cirincione began his work again. He had a little place which he had acquired as a personal refuge from the cares "that beset the day", and to which he was accustomed to fly for a brief freedom from the big house in the Via Nazionale which he had occupied for seventeen years. In this little place, at the age of sixty-four years he established a new clinic. Within a year, by the aid of private subscriptions, an excellent hospital was erected.

Such an indomitable and energetic character must of necessity disturb the sensibilities of those who are not in accord with him. Cirincione doubtless had some of the faults of great and aggressive workers: he was loyal to his friends but probably disdained his enemies and did not hesitate to express his feelings clearly and definitely. Yet in the years to come he will be remembered chiefly for the work which he accomplished and especially for the splendid group of coworkers whom he trained and stimulated and who, in Italy and in several other European countries, are perpetuating the ideals to which his professional life was devoted.

454 Franklin street

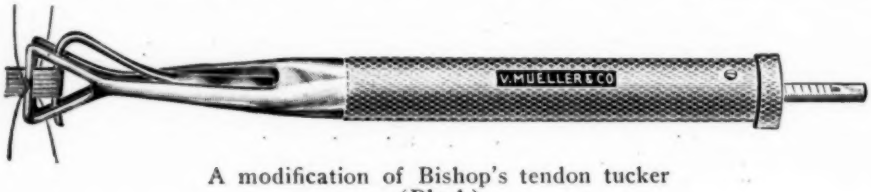
* When the present editor of this Journal visited Cirincione's clinic, after the London Conference in 1925, five skilled women artists were in constant employment for the work of the clinic, three for color drawings of microscopic specimens and two for color drawings of fundus conditions (each at a monthly salary equivalent to about twenty-five dollars in United States money!!).

NOTES, CASES, INSTRUMENTS

A MODIFICATION OF BISHOP'S TENDON TUCKER

MELVILLE BLACK, M.D., F.A.C.S.
DENVER

The accompanying illustration represents a modification which I have suggested in Bishop's tendon tucker. Those who have used Bishop's tucker have probably been annoyed, as I have, by finding after the sutures were tied that the instrument could not be withdrawn, that it was tied down to the tucked muscle. This was because one or both of the T-shaped blades at the base of the tucker had become engaged in the sutures. If this happens, the sutures must be severed, removed, and replaced, involving a delay which is most unpleasant.



A modification of Bishop's tendon tucker
(Black)

Bishop's tucker appealed to me because of its delicate construction. The operative field is not covered by a bunglesome instrument. My modification leaves the instrument just as delicate.

All that is suggested is that the T-shaped footpiece be converted into a triangle. It is impossible to tie this tucker down. It is "fool proof".

I desire to thank V. Mueller and Company of Chicago for carrying out my ideas in the construction of this new instrument.

424 Metropolitan building

A MODIFIED TENDON TUCKER

EDWARD N. DE WITT, M.D., F.A.C.S.
BRIDGEPORT, CONNECTICUT

In the modification of the Bishop tendon tucker here presented, several new features have been incorporated which add to the convenience of the surgeon when using the instrument for shortening a muscle by tucking.

A scale, graduated in millimeters, has been placed upon the lower part of one of the fixed arms ending in a "T", between which the tendon hook slides, so that the amount of muscle pulled up lies beneath it, and may be read off directly. To allow for muscle stretching, the measurement is made from the upper edge of the "T", instead of from the lower edge where the sutures are inserted. The clearance between the "T's" has been increased to 1.5 millimeters to allow room for any muscle.

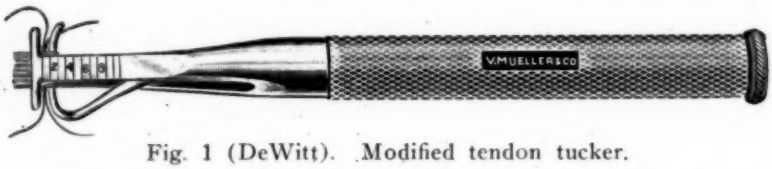


Fig. 1 (DeWitt). Modified tendon tucker.

The free end of the tendon hook has been given a slight curve to prevent the muscle from slipping off, when the hook is drawn up by the set screw at the distal end of the instrument.

The instrument should be held by an assistant perpendicular to the muscle, and if it is slightly lifted away from the eye the sutures may be easily inserted close to the lower edge of the "T", while fixation of muscle is absolute.

836 Myrtle avenue.

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

CHICAGO OPHTHALMOLOGICAL SOCIETY

February 17, 1930

Dr. Charles G. Darling, president

Blue scleras

Dr. Dewey Katz presented a child eight years of age, with fragilitas ossium, having the characteristic china-blue sclera. Although the condition was not rare it was rather infrequently seen by the ophthalmologist. This patient had had several fractures, the last one in July, 1929, involving the left femur; as was usually the case they all followed insignificant trauma. One case in the literature had had sixty-one fractures.

Ophthalmologists were agreed that the blue color was not due to scleral pigmentation but to an increased transparency of the structure. It had not been definitely decided whether the increased transparency was due to decreased calcium or to marked thinness of the sclera, both of which would allow the underlying uveal tract to show through as a deep blue. Two pathological reports had not settled the question, as in one case the sclera was found to be of normal thickness, containing the usual number of normal sized fibers, whereas the findings in the other case showed the sclera to be one-third normal thickness with marked diminution in the number of fibers, all of which were of normal size. Various congenital ocular anomalies were reported in some cases, but this patient had no other ocular pathology. The refractive error, measured under atropin, was R.E. + 2.25 sph. + 3.00 cyl. axis 90°; L.E. + 3.25 sph. + 0.25 cyl. axis 100°. Only a very small percentage of the cases reported showed myopic refractive errors. The third symptom of the triad, otosclerosis, was not present in this case. The condition was hereditary, could be transmitted by either parent, and never skipped a generation.

Melanosis of the sclera

Dr. Dewey Katz presented a man of twenty-four years, with melanosis of the right sclera. The grayish blue plaques were clearly visible to the naked eye. The areas involved were above the limbus, about five millimeters therefrom, and below the limbus slightly nasally about four millimeters from the sclerocorneal margin. These areas measured about three by ten millimeters in size, the long axis extending backward toward the equator. The slit-lamp showed some diffuse pigment deposits scattered along the superficial vessels in the episcleral tissue. The main plaques, however, were seen to be located much deeper. The fundus of this eye showed no abnormality, no sign of any retinal nevi.

The right upper and lower lids showed similar melanotic changes in their nasal halves. This gave the eyelids a bluish tinge, and the patient came primarily because of the resemblance to "common black eye," which caused comment. A similar condition was present on the lower lip. These changes in the skin and lip were considered due to the increased pigment content of the macrophages localized beneath the epithelium.

The patient reported that he had first noticed the condition about five years ago, and had considered it worse two years ago. Whether or not it was progressive was questionable, and if so it could be explained by a change in activity of the macrophages in these localities resulting in their taking up pigment and not releasing it. Physical examination was essentially negative. Drawings were made and the patient was to be kept under observation.

Thrombosis of left central vein

Dr. Max M. Jacobson presented a white male, fifty years of age, laborer, who had entered the Cook County Hospital February 4, 1930, with a history of poor vision in the right eye since child-

hood; the vision of the left eye had suddenly decreased two months ago. He had been able to read well prior to that time. There was some vague constant pain in that orbit for a short time. Vision R.E. 15/200; L.E. 2/10-1; with correction, 1/10 and 4/10 respectively. In the left eye were found evidences of venous obstructions with engorgement of veins, dilatations and enlargements of characteristic sausage shape; deep and superficial hemorrhages with obscuration of veins; retinal edema and grayish white patches. Diagnosis was a complete branch thrombosis of the left central vein, involving the superior, temporal and nasal veins more extensively. Physical and neurological examinations were essentially negative. Blood pressure was 90/60; spinal and blood Wassermann were negative; urine and blood chemistry normal. Tension Schiøtz, R. 18, L. 21.5 mm.

Cyclic oculomotor nerve paralysis

Dr. Elias Selinger presented a well developed sixteen-year-old youth who had come to the eye department of Rush Medical College in December, 1929, complaining of right-sided ptosis, inability to see with the right eye, and right divergence, all symptoms being present since birth. Two older and one younger brother were apparently well. The mother had been an inmate of an insane asylum since the birth of the younger brother twelve years ago.

General physical examination revealed a four plus spinal Wassermann, negative blood Wassermann, and Hutchinsonian teeth. Neurological examination was negative except for eye findings; psychiatric examination showed the intelligence quotient to be 71. The patient had been on antiluetic treatment from April to June, 1928, at another institution, and was again placed on the same treatment. There was a history of several operations in childhood for correction of the squint and ptosis, on which no data could be obtained from the family.

Vision R.E. 3/200, fixation being eccentric; L.E. 20/20+3, unaided. The left eye was normal. The changes found in the right eye were those of incomplete paralysis of all branches of the oculomotor nerve, in two stages: (1) The flaccid stage; the upper lid drooped so that the palpebral fissure was narrowed to three millimeters, the eye deviated outward (squint angle forty to forty-five degrees), and the pupil dilated to eight millimeters. This stage lasted about twenty seconds and was followed by a spastic stage in which the outer half of the right eyebrow moved upward, causing wrinkling of the skin on that side of the forehead. The upper lid was elevated in a jerky manner until the palpebral fissure was eight to nine millimeters wide, and what appeared to be a spasm of the internal rectus moved the eyeball nasalward so that the squint angle diminished five to eight degrees, and at the same time the pupil contracted to three millimeters. This stage lasted fifteen to twenty seconds and was again followed by a flaccid stage. The entire cycle required about sixty to eighty seconds and was constantly repeated.

Light, effort at convergence and accommodation, and effort at elevation and depression of the gaze had no effect during the contraction stage and caused only a momentary twitching of the iris and the eyelid during relaxation. A pseudo-Graefe sign was present in the spastic stage: when the patient was asked to look down, the right upper lid remained elevated. Voluntary movements consisted of good abduction, poor adduction, and nasal rotation of the cornea on effort to look down. The abducens and trochlear nerves were therefore not involved. The eyeball could not be elevated. The caruncle and plica semilunaris were prominent and were displaced forward, possibly due to previous operation.

Pilocarpine, two percent solution caused contraction of the pupil to 2.5 mm., while the lid and adduction phenomena continued as before. While the pupil was contracted the patient complained of pain in the right eye, rhythmic in character and most severe during what would correspond to the spastic stage of the ciliary muscle cycle.

Homatropin dilated the pupil to eight millimeters, abolished the pain, but had no influence on the lid and rectus medialis changes. The right pupil did not react consensually, the left did. Peripheral visual fields for form and color were normal and there were no central scotomata. The fundus showed no pathology.

A careful search of the literature revealed only twenty-eight cases of this interesting disease. This was the 29th of the series, and so far as could be determined the first to be described in American literature. A more complete report would be published in the near future.

Crystalline deposits in the vitreous

DR. HARTGRAVES showed a case in which examination of the blood showed calcium content 10.5 grams per 100 c.c., and cholesterol 197, which was slightly above normal. The opacities varied in size and moved very rapidly with the movements of the eye. They appeared to cause no symptoms.

Retinitis pigmentosa

DR. G. F. SUKER showed this case again on account of the results obtained by treatment with x-ray, cod liver oil, liver and glandular therapy. The patient had been under observation for the past seven years. There had been much improvement.

The central visual acuity with correction was 20/20 in each eye, though in each a cataracta complicata had been removed. Because of the thyroidectomy and supervening modified tetany, thyroid and calcium were more or less constantly given. The field of vision had been uniformly enlarged by ten to fifteen degrees. The patient did not suffer greatly from night blindness.

Clinical study of sixteen cases of ocular tuberculosis

Drs. George F. Suker and Beulah Cushman read a paper on this subject which will be published in the American Journal of Ophthalmology.

Etiology of phlyctenular conjunctivitis

DR. STANLEY GIBSON said that many hypotheses had been advanced as to the cause of phlyctenular conjunctivitis. One cause was impairment of general health. The series herein considered included 92 cases which were studied completely. According to the history obtainable for each patient, 64 were robust, 16 in fair health, and 12 delicate. On physical examination 52 were good physical specimens, 28 fair and 12 in poor physical condition. That was to say, they were rather above the average in general health. Another cause often given was poor living conditions. In the first 52 cases studied, a personal investigation was made of the home environment, as to crowding, ventilation, and heating. It was found that the living conditions were above the average among dispensary patients; 23 had good living conditions, 12 fair, and 18 poor. Therefore it was felt that this factor played no great part in the condition.

Gastrointestinal disturbance had often been mentioned as a predisposing cause of phlyctenular conjunctivitis. A history of such disturbance in this series was conspicuous by its absence. There was no history of vomiting, no diarrhea, and most of the patients had good appetites. No connection whatsoever could be found between gastrointestinal disturbance and the outbreak of the disease.

Czerny considered phlyctenular conjunctivitis to be one of the symptoms of an exudative diathesis in children. It was felt that if any single symptom was considered diagnostic, such as cradle cap, nasal catarrh, or eczema, about thirty percent of these cases showed evidence of this diathesis: in other words the presence of the phlyctenular conjunctivitis itself was the only evidence of an exudative diathesis in two-thirds of the cases. Furthermore, such an explanation would be merely a restatement of the problem.

Another condition claimed to be a causative factor was the presence of tuberculosis, and for that reason a Pirquet test was made on each case. Of the ninety-two cases, ninety gave a frankly positive tuberculin test, and in the majority the reactions were unusually violent. The two giving negative

reactions were interesting. One of these patients, a woman of thirty-five years, had an acne rosacea. Fuchs had pointed out that individuals with this condition might have an eye lesion practically indistinguishable from phlyctenular conjunctivitis. The second case had an atypical efflorescence on the eye, without tearing or photophobia. In this case the diagnosis was in doubt.

From the clinical study the presence of tuberculosis seemed alone to be the outstanding condition of all the cases. However, some experimental work was undertaken with the hope of further elucidating the etiology. Healthy rabbits received instillations of horse serum, staphylococcus vaccine, tuberculin, and other irritants into the eye, with uniformly negative results. When tuberculous rabbits received tuberculin in the eye, reactions regularly followed. Out of a large number of such experiments, lesions occurred in six animals which had the appearance of phlyctenules. In two cases phlyctenules occurred in the absence of local irritants of any kind in the affected eye. In these two cases the conditions under which human phlyctenules occurred seemed to be exactly duplicated. The animals were tuberculous. No instillations of any sort had been made into the affected eye. The appearance of the lesions was typical and the pathological examination revealed a close similarity to the findings in human phlyctenules. Hence the experimental and pathological studies led to the same conclusions as the clinical work.

The essayist stated that he had not come upon any clean-cut, exhaustive piece of work in the literature which had advanced any other cause than tuberculosis for phlyctenular conjunctivitis.

Discussion on papers of Drs. Suker and Cushman, and Gibson. Dr. E. V. L. Brown said that views concerning the diagnosis and treatment of tuberculosis of the eye, especially in the absence of tubercles, varied greatly. He did not look upon a tuberculin reaction as positive unless the temperature reached about 101°. In Dr. Cushman's paper, the cases were reported as two with temperature of 101°, one 101.2°, one 102.4°; one had only 100° and two others only 99°; the remaining cases were listed as "definite," "marked," and "very marked". A number might of course have been well over 101°, but he did not believe a diagnosis should be made on tuberculin reaction alone, even if the temperature were 102° or 103°, and this criticism would apply to all the cases. His discussion of the paper could not be sympathetic, inasmuch as he discredited the effect of tuberculin treatment because this type of tuberculosis was largely self-limited.

Dr. Joseph Brennemann said there were two types of tuberculous manifestation not only in the eye but elsewhere; (1) the tuberculous invasion of the eye shown by Dr. Brown, and (2) phlyctenular conjunctivitis. The latter used to be classified as a toxic tuberculous affair, but today one spoke of an allergic manifestation.

Dr. Benjamin Goldberg said that phlyctenulosis, while not definitely tuberculous, might be classed as a tuberculide, or a pathologic entity associated with changes in the body chemistry resulting from tuberculosis allergy. One might also compare it with scrofula, which condition had been considered tuberculous over many years, until pathological study demonstrated that the majority of such adenopathies were not produced by the tubercle bacillus. He believed one factor had not been considered in Dr. Gibson's research, that was, changes in the body chemistry as affected by various food substances, particularly on the basis of an adequate, balanced dietary of proteins, fats, carbohydrates, vitamins, and minerals.

Personally he had dispensed with the use of subcutaneous tuberculin diagnostically, except where all other methods of diagnosis had been exhausted and it was desired to have an additional negative factor. There was also danger of increased exudation in the eye. He had used tuberculin for a period of over three years in institutional work, had observed no benefit from its use, and had finally decided

that its only possible indication was in a localized, limited, quiescent tuberculous process, and this condition, the tuberculosis being walled off, required no special tuberculin irritation.

Dr. Michael Goldenburg had been interested in this problem for many years. He reviewed facts and arguments covered by a paper published under his name in this issue of the American Journal of Ophthalmology.

In reading Dr. Gibson's work on the subject, while it was distinctly constructive, he did not believe that a real phlyctenular papule had been produced, nor that the experiments could be compared to the process in the human being.

Dr. G. F. Suker said that chronic tuberculous ocular lesions appeared mostly in seemingly healthy individuals, or, in those in whom the general tuberculosis had apparently healed. There was no doubt a bacteriological as well as a clinical difference between a general tuberculosis and an ocular tuberculosis—a difference along the lines now considered between general paresis and tabes dorsalis. Just as in syphilis the various diagnostic tests might be negative, yet the patient be syphilitic, so might a patient have a tuberculous eye lesion and yet no test verify it. Still in either case the luetic or tuberculous specific medication would effect a cure. Clinical evidences were oftentimes more accurate than laboratory or animal tests.

In none of Dr. Cushman's cases did any foreign protein, other than that of the tubercle bacillus, produce any results; whereas in each of the cases with relapses, of which Dr. Cushman spoke, the condition was again cleared by appropriate tuberculin medication.

Dr. Robert Blue said there was one point of terminology which he wished to mention. The name phlyctenular conjunctivitis only had been used. Phlyctenular keratitis and phlyctenular keratoconjunctivitis were other useful descriptions and localizing terms, but he preferred phlyctenular disease as being more inclusive.

Dr. Beulah Cushman (closing), in response to Dr. Brown's statement that he did not like to call a tuberculin reaction positive without at least a temperature of 101°, said that the most typical case reported, no. 3 of the series, which showed two tubercles of the choroid, one healed and the other new, had not shown a reaction until 10 mg. of old tuberculin was given, and then her temperature was only 99°. She responded most satisfactorily to the treatment.

Dr. Stanley Gibson (closing) said that in 1833 Mackenzie had given a description of the disease in connection with phlyctenular conjunctivitis, regarding the scrofulous constitution as the chief predisposing cause of this condition. This was fifty years before the tubercle bacillus was discovered.

In reply to Dr. Goldenburg, he could merely say that if the latter found as high a percentage of positive Pirquet reactions among other admissions to the dispensary as among the cases of phlyctenular conjunctivitis, his experience was altogether unique. Furthermore, in studying the effects of treatment to ascertain the cause, he was undertaking a very hazardous thing. Some of the cases in Dr. Gibson's own series had got well quickly with no treatment, others were persistent in spite of treatment. In his opinion it depended largely upon the location of the phlyctenule. He agreed that tuberculosis in a rabbit did not approximate closely the type of tuberculosis encountered in these children. In his opinion the obtaining of typical phlyctenules in these animals was all the more striking.

Robert Von der Heydt,
Secretary.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

February 18, 1930

Dr. Sylvester J. Beach presiding

Spontaneous bilateral separation of the retina

Dr. George S. Derby showed a boy ten years old with spontaneous bi-

lateral separation of the retina. He said that it was very unusual to have a spontaneous bilateral separation of the retina in a person as young as this boy. There was no history except that vision was blurred. On examination there were opacities in the lower part of the vitreous and a well developed separation of the retina. There had been no trauma nor anything else to throw light on the cause. There was a small tear of the retina found in the right eye; none could be demonstrated in the left. The patient was put in bed twelve days with the eyes tied up. Both separations subsided. Soon after the eyes had been untied the separation recurred to a certain extent. It seemed that the most advisable treatment was cauterization, coming as near as possible in contact with the tear. Afterward the patient was kept in bed with his eyes bandaged. The left retina was nearly back on the pigment epithelium again but in the right the cauterization was made a little too far from the tear. He was to come back again for another puncture of the right eye and cauterization again. Dr. Derby had tried this treatment in three cases without success. Other men who have used this procedure have reported much better success.

Dr. Knapp said that in two out of three such operations which he had done recently the retina had reattached. Other statistics from abroad seemed very favorable. The treatment attempted to shut off the tear in the retina. After locating the tear, an electric cautery was put as nearly as possible in contact with it for a few seconds; the eyes were then tied up and the patient kept as immobile as possible. (The bandage should not be disturbed for the first five days after operation.)

Discussion. Dr. Allen Greenwood asked why a boy of ten years should have a simultaneous spontaneous symmetrical detachment of the retina without any injury or disease. At the time he saw the patient he thought it might be a nephritis which had produced edema and lifted up the retina. He also considered the possibility of some faulty development of the choroid at the location of the fetal cleft.

Acute bilateral retrobulbar neuritis, relieved by lumbar puncture

Dr. John Jennings showed a woman, aged sixty-nine years, first seen by him January 27, 1930, complaining of short attacks of blurred vision for past three days with continual occipital headache the previous morning. Vision was very blurry but had returned to normal.

About two weeks previously she was taken to Newton Hospital with a condition resembling gall bladder disturbance. While there she had a badly swollen face. The eyes were closed. Trichinosis was suspected. Then she was unable to open her jaws. She had an occipital headache but no disturbance in vision. The trichinosis and gall bladder were ruled out.

Physical examination on the twenty-seventh showed a well developed, well nourished patient. The pupils were slightly dilated and reacted to light sluggishly. The consensual reaction was present. Vision was: right eye, nil; left eye, good, for distance and near. The visual field was gone in all except the lower quadrant. Both fundi showed pale discs with physiological cupping. The right disc was slightly blurred above; the left disc margin was normal.

The next day both eyes were totally blind. The patient was seen by Dr. Greenwood, who diagnosed papillitis in the right eye. The left eye at this time showed a slight blurring of the disc.

On the next day x-rays of sinuses and teeth were negative. Wassermann was negative. Urine was normal. Blood pressure was 105/80. Neurological examination was negative. Sixty c.c. of spinal fluid were drawn off and found perfectly normal. The ophthalmoscope showed two diopters of swelling in the right disc and one diopter in the left.

On January 30, thirty c.c. more of spinal fluid were drawn off, and one hundred c.c. of twenty-five percent glucose were given intravenously. The following day, after removal of spinal

fluid, a marked improvement was noticed in the disc of the right eye. The edges could be made out and there was less congestion of the retinal vessels and the pupils were slightly smaller. She could tell whether a flashlight was on or off. The constant headache had disappeared. The eye condition had remained the same except the fundi had gradually improved until on February 10, 1930, both discs were normal. There was very little congestion of the retinal vessels, but the vision had remained nil in both eyes.

On February 17 the sphenoids were exposed. No secretions were noted. Membranes were in good condition. A piece of loose membrane was removed and sent to the laboratory. The next day the eye condition remained the same. The nerves had begun to whiten.

Discussion. DR. WILLIAM ROWLAND reported a similar case in a shoe cutter, aged twenty-six years, seen two months previously. Within two days he had total loss of all vision in the right eye. The other eye showed normal vision and field. No history of illness except a previous cold was obtained. The fundus showed only some raising along the nasal border of the disc with no true elevation. Years ago he had all his teeth extracted and wore full plates. X-rays were taken which showed retained roots with marked infection. In the right antrum there was apparently a cyst. His vision failed from above downward until he had a total loss in that eye. The roots were removed and the culture showed streptococcus infection. He began to recover his vision rapidly and in a week or ten days he had recovered all his sight in that eye. He was being watched for any signs of multiple sclerosis.

DR. ALLEN GREENWOOD stated that when he saw Dr. Jenning's patient in the hospital the next day she had nearly three diopters of elevation in one eye and one diopter in the other; very distinctly engorged veins; no vision.

Case of paraffinoma

DR. EDWARD K. ELLIS showed a woman with swelling on the lower lid extending from the outer to the inner margin of the orbit. She stated that this had appeared immediately after another doctor washed out the sac with some kind of oil, after passing probes. That had been a year ago last month, and the condition had remained the same.

S. J. BEACH,
Reporter

PITTSBURGH OPHTHALMOLOGICAL SOCIETY

February 24, 1930

DR. EDWARD B. HECKEL, president

Knife blade in orbit

DR. W. E. CARSON reported the case of a sturdy Italian who had walked into the front door of the West Pennsylvania Hospital with a vague story of having been attacked with a knife during a quarrel with his drunken roommate. Beside other injuries, there was a two centimeter stab wound about one centimeter above the left eyebrow.

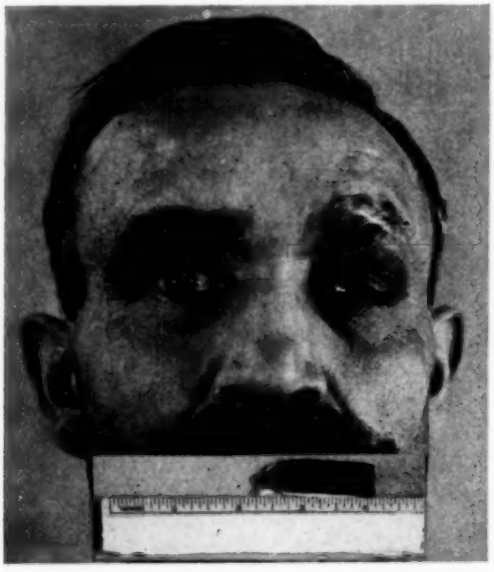
Some days later, x-ray examination revealed no fracture but showed a knife blade in the left orbit about two inches long and one-half inch wide, located in the temporal portion of the orbit, the point being directly backward and outward, apparently projecting through the temporal portion of the orbital wall under the temporal muscle.

There was marked edema and conjunctival chemosis. The left wall was proptosed about 4 mm. and was displaced downward about 15 mm. Mobility was limited in all directions to about fifteen degrees from the primary position. The ball itself had escaped but the eye was found to be aphakic with a small corneal scar from a mine accident fifteen years previously. The fundus appeared normal, although the view was slightly hazy because of a thin vitreous membrane. The vision of the left eye was *2/60* with plus ten sphere.

A general anesthetic was contraindicated because of blood in the urine and many râles in the lungs. Removal was

therefore deferred until the fourth week, when these conditions had cleared and when the condition as to the left orbit had also much improved.

The edema had disappeared and there was no longer proptosis of the ball, although there was still a downward displacement of three to four mm. and marked impairment of motility, the motion of the ball outward being limited



Knife blade in orbit (Carson). Size of steel fragment is indicated below.

to about fifteen degrees, inward thirty-five degrees, downward forty degrees, and upward not at all above the horizontal.

Under ether anesthesia a two and one-half cm. incision through lid and orbital fascia was made at the upper outer edge of the rim of the orbit. There was no special difficulty in locating the broken knife blade, but the blade was firmly wedged in the bone of the orbital wall. The small curved mosquito hemostats which were found most suitable for the purpose slipped off the blade repeatedly. But after repeated attempts, using a twisting motion to loosen it, the blade suddenly yielded and came out. At the first dressing, position and motility of ball were much improved. When the patient was discharged two weeks later the eye was practically normal in these respects, although a slight ptosis persisted, which it was thought would continue to improve.

The size of the blade fragment was forty-seven mm. or one and seven eighths inches long, twelve mm. or seven-sixteenths of an inch wide. It seemed remarkable that a blade of such size could have entered the orbit with such force without injury to the ball.

V. P. Blair, in the American Journal of Ophthalmology, 1921, reported the case of a woman who had carried a knife blade measuring two and one-half by three-eighths of an inch in her right orbit from childhood to the age of twenty-seven years, when it was discovered by x-ray examination because of a recent injury. She had fallen on a pocket knife when a child. There was divergence and much reduced vision. The blade was removed by Krönlein operation.

A. O. Pfingst of Louisville, Kentucky, in the American Journal of Ophthalmology for August, 1923, reported a case in a messenger boy of sixteen years, who in a fight had received a stab wound in the left temporal region. A knife blade was found to be present in the orbit after he applied for treatment a week later because of failing vision in left eye. Operation was refused until four months later when the blade was removed by an incision over the temporal bone, the broken end of the blade which protruded from the bone being then grasped and removed with a twisting motion. Blindness resulted, thought to be due to injury to the optic nerve. The size of the blade was 4 cm. long and 13 mm. wide.

Congenital coloboma of the lid with dermoids

Dr. W. E. Carson presented a case as an example of a typical and rather pronounced condition described in the literature under the term of congenital dermoids or lipodermoids of the cornea, frequently associated with colobomata of the lids and other congenital malformations.

Such a case was described by Horner and Cordes in the American Journal of Ophthalmology for December, 1929, with brief discussion of the literature and a fairly full bibliography.

Among the various theories advanced to account for these defects the one thought to explain best the greatest number of facts was that of van Duyse, namely that the defects were due to pressure of amniotic bands. Not only did this theory explain the colobomata but it also explained the cutaneous bridges, dermoids, and the like, these being persistent portions of the constricting bands.

The patient here shown, a baby boy three and one-half months old, was born with a coloboma of the right upper lid, a dermoid tumor mass to the temporal side of the right cornea, a dermoid tumor mass to the temporal side and below the cornea filling the lower cul-de-sac of the left eye, macular opacification of the upper temporal third of the left cornea, supernumerary auricles both right and left, a spherical pedunculated tumor mass about one cm. in diameter attached to the middle portion of the left cheek, and a three mm. tumor on the left side of the chin. He also had a club foot.

The small cherry-shaped tumor which was attached to the left cheek by a short, slender, almost threadlike pedicle was removed soon after birth. Covered with skin, it was found to consist internally of two nodules composed of fibrolipomata and fibro-chondrolipomata. The coloboma of the right upper lid was situated mostly but not entirely to the inner side of the vertical midline of the lid and involved most of the inner half of the edge of the lid except for a portion about three mm. wide which included the upper lacrimal punctum. The coloboma represented about 13 mm. of a 25-mm. lid edge. The coloboma was roughly quadrilateral in shape and included about one-half of the vertical width of the lid, the edges as usual in such cases being covered with conjunctiva and free from cilia.

The dermoid tumor mass of the right eye consisted of two lenticular lobules which more than filled the interpalpebral space on the temporal side. The lower lobule encroached upon the lower temporal portion of the cornea for about two millimeters beyond the limbus, between the 5:30 and 8:30 o'clock positions.

The tumor mass on the left side entirely filled the outer two-thirds of the lower cul-de-sac, and extended up around the outer edge of the cornea,

Coloboma of the eyelids (Carson).

slightly encroaching on to the cornea as far as about the one o'clock position.

These tumor masses were yellowish, finely streaked with red, and moderately relaxed rather than tense. They protruded in both eyes on forced closure of lids, as when the child cried.

A conservative opinion had been given as to plastic operation at some later date.

GEORGE H. SHUMAN,
Secretary.

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

February 14, 1930

MR. CYRIL WALKER, president

(Continued from page 627, July issue of the Journal)

(Note: By a peculiar oversight, the printer's "makeup man" dropped this portion of the report from our July issue.)

Report of MR. RANSOM PICKARD'S paper on **the red field and optic disc resistance in glaucoma and allied conditions.** (Continuation.)

Keeping separate the intermittent group, he divided each of the other two groups into two sections; that of average white radius of twenty degrees or more; and those of less than twenty degrees, the latter comprising the more serious cases.

An examination of normal cases was made to ascertain the variations of the 10/1000 red field. Of nineteen eyes it was found that six showed a red percentage of less than sixty, most of the remainder being above eighty percent. In other words, one-third of them showed small fields. He could not find any cause for this.

In the chart showing the red percentage in cases of over twenty degrees average white radius, the close correspondence between the two groups was at once seen, so that either could be substituted for the other without any great inaccuracy. It could be said that about half of each group had a distinctly smaller red field than the normal.

The main anomaly in the red-field graphs was that while the two groups of tension over 27 and under 27 mm. had a fairly similar difference from the normal, the intermittent class approximated the normal. It would appear that there was a difference in causation to account for this inconsistency. If it were assumed that in the group with tensions less than 27 mm. an abnormal weakness in the nerve head caused this to give way easily, while in the groups of intermittent glaucoma and of a tension of 27 mm. or higher there was an average resistance at the spot, then all the groups came into line, each behaving according to the interaction of the resistance of the nerve head and the tension of the globe.

As to the clinical progress of the cases in which the tension was less than 27 mm., eight eyes got definitely worse. Three of these eyes (in two patients) were trephined, but the fields continued to get smaller and the cups to increase. Eight eyes had an increase in the size of the cups, but no decrease in the 3/1000 field. The three of them had a decrease in the 10/1000 field.

Eleven eyes were no worse in cups or fields over a period varying from eight months to three and three-quarter years. In these cases the 3/1000 fields varied from 32 to 9 degrees, the cups from 100 to 70 percent. There was one exceptional cup of 12 percent.

Speaking generally, the larger the cup and the smaller the field the worse was the prognosis. If it was assumed that the process or processes causing weakness of the nerve head were of varying intensity and duration, so that some cases came to an end before the field was greatly affected, while others progressed much further, this explained the varying clinical pictures. If it was also assumed that the nerve fibers and connective tissue elements in the head were variously affected, the very severe course of the trephined cases could be explained by an affection of the nerve fibers, beside that caused by the normal eye tension upon nerve fibers insufficiently supported by surrounding connective tissue.

In intermittent glaucoma the red fields approximated the normal. The two groups of tension above and below 27 mm. were practically identical in age, sex, size of disc cups, and degree of loss of red and white fields, but differed in tension. There was evidence which suggested that the progress of some of these cases became arrested. If so, it tended to prove that the main factor was the weakness in the nerve head, not the pressure in the globe. There was no evidence as to the nature of the weakness in the nerve head. None of the cases had any symptoms of general disease of the nerves or of the central nervous system.

(Reported by H. Dickinson)

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology
March 14, 1930

MR. CYRIL WALKER, president

Melanosis—glaucoma

MR. J. F. CUNNINGHAM showed a man aged fifty-six years in whose eyes a spot had been noticed at the limbus last August. In October the man refused operation. During the past six weeks he had developed definitely increased tension, and a large loss of visual field. The spot, which was chocolate-colored, remained, with congested vessels round it. There was a small amount of pigment on the lens capsule. The exhibitor thought it was a melanoma which had become malignant.

Birth injury to the left eye

MR. A. W. ORMOND showed a boy who had been brought to him four years previously with a defective left eye. There were the typical linear scars in the cornea associated with an accident at birth due to the use of instruments. Another boy in the family had also been delivered by forceps, and that boy had a defective right eye, but he had no corneal changes. He had optic atrophy. The fellow eye was normal, with vision of 6/6.

Angioid streaks in the retina

MR. OSWALD MORGAN showed a case which had been shown in 1927, since which time there had been very little change. There were also whitish patches, reminding one of retinitis circinata, and also peripheral patches of choroiditis.

Discussion. MR. LESLIE J. PATON said that the angioid streaks began with hemorrhage into the outer layers of the choroid, and the result was to produce wrinkling in the membrane of Bruch. As to cerebromacular disease, he would not put these streaks down to typical macular disease.

MR. RAYNER BATTEN said the younger brother had the same condition. The sister's sight had failed suddenly in both eyes. She had all the evidences of extensive macular or central hemorrhage. The angioid streaks were in existence long before the hemorrhage occurred. It seemed as if there were chronic leakage from the choroidal vessels, which gave rise to angioid streaks.

Tuberculous conjunctivitis

MR. MORGAN showed again this patient in whom there was now some granulation tissue, showing typical giant-cell formations. It was certainly tuberculous conjunctivitis now. The physicians had not been able to find any signs of chest trouble; nor did there seem to be any generalized tuberculous condition.

Discussion. MR. R. L. REA said that the method practiced by Rollier, in Switzerland, was to invert the eyelids for some minutes at a time and expose to bright sunlight. He, the speaker, had tried that in London, but made the mistake of not having the gland removed, so that, though the condition in the eyelid completely cleared up, a gland below the jaw broke down.

Cerebromacular disease

MR. MORGAN also showed a brother and sister who had been noticed to be mentally slow and had been brought to the hospital because epileptic fits developed. The girl showed diffuse pigmentary disturbance at the macula, and the boy had the peripheral type, something like retinitis pigmentosa. Both children went to the blind school.

Bilateral coloboma of choroid

MR. MORGAN showed a boy who had no vision in the left eye; the right was myopic, and the patient had what Mr. Morgan took to be ciliary vessels coming over the edge of the coloboma. It looked as if the fissure had not closed properly and the vessels had come through the lower level.

Leontiasis ossium

MR. E. R. CHAMBERS showed a girl aged thirteen years. When she was first seen in 1927 he thought there was

some enlargement of the face but that it was a congenital asymmetry, so nothing was done. She reported again after two years, and there was then considerable protrusion of the right side of the face, the right orbit was lower than the left, and the whole orbit was pushed forward. Vision was less than 6/60. The thyroid was enlarged.

Nodular keratitis

MR. CHAMBERS also exhibited a man whose corneas showed grey, discrete opacities. The patient's mother, aged sixty-five years, had an exactly similar condition, though more advanced.

Osteitis deformans with retinal hemorrhages

MR. A. W. ORMOND spoke of a man sixty years of age who had this disease. He had been referred because of failing eyesight, and the speaker found retinal hemorrhages but no nerve lesion.

Krukenberg's spindle

MR. J. H. DOGGART showed a man aged forty-two years who had this condition. At the back of each cornea he had a collection of reddish-brown granulations along a vertical line down the middle to the limbus. There were similar granulations circulating in the anterior chamber. The granulations were not arranged in spindle fashion, and there was slight myopia.

Tay's choroiditis

MR. ISIDORE SPIRO showed a case in a woman aged sixty-five years. Her sight had been failing two years. Vision was 6/36 in the right eye, 3/60 unaided in the left. Both the pupils and the tension were normal. No scotomata were found.

Tar carcinoma

MR. EASON sent a case in which the conjunctiva had been injured by tar. In the first instance there was supposed to have been a tuberculous lesion, but afterwards the sections showed a change resembling carcinoma. The question which arose was as to whether this was tar carcinoma.

Parinaud's conjunctivitis

MR. DOYNE read a note by Mr. G. G. Penman on Parinaud's conjunctivitis, a case of which had been shown at the December meeting of the Section. Mr. Penman had excised a small portion of the affected conjunctiva and the preauricular gland, which latter was beginning to break down. Guinea pigs injected with the material died in six weeks from tuberculosis. The eye condition was clearing up well under treatment with a lotion of hydrogen peroxide.

(Reported by H. Dickinson)

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

March 11, 1930

DR. E. D. WATKINS presiding

Choroiditis, retinal detachment, and cataract

DR. J. B. BLUE presented Mr. L., aged fifty-seven years who had high myopia, choroiditis, and detachment of the retina in the right eye; high myopia and cataract in the left. He had been first seen January 22, 1926. Vision had been poor all of his life and, although he had had many pairs of glasses, none were ever very comfortable. Vision in the right eye with a minus 13 D. sphere combined with a minus 2 cylinder axis 45 degrees was 20/50 minus 1; left eye with a minus 13 D. sphere was 20/100. At this time no glasses were given. His vision was not clear but nothing other than the myopia was found. Many diseased teeth were removed by his dentist. Wassermann and urinalysis were negative. After this his vision became better and he was seen no more for his eyes until March, 1928. A complete opacity of the left lens had formed. He was not seen again until December 30, 1929, when he came complaining of poor vision, objects looking

red. There was no pain. A severe head cold had preceded this by one week. Vision was very much reduced. Examination of the right eye showed media very cloudy. He was referred to a dentist who extracted the remainder of his teeth, which were diseased. X-ray of sinuses showed mild sinus cloudiness. Wassermann was negative. Urinalysis showed albumen and casts. With extraction of teeth and administration of potassium iodide the vision began to clear, and on January 15, 1930, there was noticed for the first time a large detachment of the retina in the lower portion of the globe. This detachment was probably simple, judging by a transillumination test. On May 9th tension O.D. was 11, O.S. 10 mm. (Schiøtz). Vision in the right eye with minus 13 D. sphere was 20/200; left eye, light perception.

Discussion. Dr. Rychener thought this an ideal case for ignipuncture after the method of Gonin, as the detachment was all in the inferior quadrant. He advised intracapsular extraction of the cataract in the left eye.

Dr. A. C. Lewis had once saved the vision of a patient's only eye in which retinal detachment had occurred. He did a scleral trephining between the attachment of the superior rectus and that of the superior oblique muscle and also one between the insertion of the inferior rectus and that of the inferior oblique below, with prompt and permanent reattachment of the retina. Seen quite recently, this patient still has good vision. The speaker thought the prognosis for removal of the left lens should be good.

Dr. Blue remembered Dr. Lewis's case quite well, and had had a similar treatment in mind for this one but had postponed it because of the recent choroiditis.

Congenital interstitial keratitis and annular posterior synechia?

Dr. A. C. Lewis said he had been called in consultation by Dr. W. T. Pride on January 5, 1930, to see a baby two days old with a defective right eye. Examination showed a dense interstitial opacity over the central part of the cornea, and a cloudiness of the surrounding cornea. The pupil could not be seen through the center of the cornea, but by oblique illumination was seen to be occluded and fixed. There was an absence of conjunctival and ciliary congestion and of other acute inflammatory symptoms.

Believing this a luetic infection, blood specimens from patient and both parents were examined, but were all reported negative.

Under atropin, dionin, and yellow oxide ointment, the eye symptoms cleared rapidly. At the end of two months all adhesions were broken down and the pupil was round and normal in appearance. There still remained a slight cloudiness of the pupillary area of the cornea.

R. O. Rychener,
Secretary

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THE EYES OF SCHOOL CHILDREN

Soon after Donders called attention to the practical importance of hyperopia and astigmatism, statistics were sought as to the relative frequency of the different forms of ametropia; and these were largely based on the examination of the eyes of school children. In 1885 B. Alexander Randall found that the eyes of more than 200,000 persons had been so tested and the statistical results recorded in the literature. When Risley made his report on 4,000 eyes of school children, in 1881, he recommended certain needed reforms in the lighting and furniture of the school rooms, and pointed out the importance of astigmatism and choroidal lesions in the development of myopia.

In 1890 a program was offered "to save the eyes during school life". The problem was thus stated: "The paramount question in the location and planning of every school building should be, where and how can be obtained the best possible light for every pupil?" The program included the correction of faulty methods of using the eyes, the use of glasses, the use of print adapted to the vision of the eyes, care of the child's general nutrition and health, and continuous intelligent supervision of the school room by teachers trained as well as possible for that part of their work. Allport emphasized the financial cost of defective sight, and took up the idea of training teachers to test their pupils' vision and to supervise ocular conditions in the school room. This method of definite study of what each pupil can see and as to the effect of school life on vision has been widely applied. Dr. Thomas D. Wood found that in the years 1922-23 there had been 1,239,018 thus examined in Pennsylvania and over one million in other states, an average of 12 percent being found defective.

After 1907 special schools, and also

special methods to meet the needs of children with vision so imperfect that it was liable to be made worse during education by the usual methods used for children with good sight, were established in Great Britain under the influence of N. Bishop Harman. These have been introduced and used in America since 1911, particularly in Cleveland, Detroit, and Minneapolis; and a general plan for such sight-saving classes has been in operation throughout the state of Ohio for about five years. As now developed the plan includes sight-saving rooms, chiefly in the grade schools, where children who require such help are gathered under special teachers for a part of each day, to receive instruction by blackboard work, through books printed in large type, and under the most favorable lighting conditions. At other hours these children receive oral instruction in other rooms with children of the same grade who have full vision and who are taught throughout by the usual schoolroom methods.

It is difficult to estimate the influence which examination of the eyes and vision of school children has exerted on the general appreciation of the importance of public health. In the early years of such examinations it was stated that the vision of children of the first grade need not be tested, as with them the results were unsatisfactory and not reliable. Now that the field workers of the National Society for the Prevention of Blindness have demonstrated how to make tests of vision on children of from four to six years, so as to give perfectly definite and reliable data as to the vision of children entering school, such examinations will be more extensively resorted to. The tests used have been in the hands of ophthalmologists for years, but the best method of applying them had not been understood.

Recently the National Education Association has published a book entitled "Health education, a program for public schools and teacher training institutions". It is an octavo volume of 250 pages, prepared under the direction of Dr. Thomas D. Wood, chairman of the joint committee of the National Education Association and the American Medical Association. Only a small part of this volume is devoted to the eye and vision; but ophthalmologists can well afford to look into it, to learn the point of view from which health problems are regarded by physicians in various lines of practice, by educators, by sanitarians, and by the most intelligent part of the general community.

Edward Jackson.

PROBLEMS OF THE SIGHTLESS

Ophthalmologists are primarily interested in the conservation of sight: they have only a secondary interest in the problems of the sightless. To be sure these are problems to be handled by those who have made a special study of the subject and who are able to devote their entire time to this work. However, anything that will give a clearer insight into the feelings and experiences of the blind concerns the oculist.

Several years ago a beneficent person bequeathed a sum of money to an organization for the blind, the interest to be used in prizes for the best essays each year by students from the state school for the blind.

The prize essays for this year contained some interesting observations. Three points, perhaps, are especially deserving of consideration. The first is that the blind were given every care and opportunity for development in study and play during the years of schooling, but that after this period of education they were graduated into a rather nonappreciative world without further provision to help them continue the training so well begun.

The second point is that in a large city, where the blind number several hundred, there should be some meeting place set aside for the blind and providing entertainment especially designed for them, and in which particularly they could visit of evenings with friends whenever they cared to do so. For the blind there are many lonely

hours, and for them conversation is genuine recreation and education.

The last point is that the blind person should be met, greeted, and conversed with as an intellectual and social equal, and thus helped to dissipate the inferiority complex which is almost certain to possess him. This can best be done by a natural attitude, conveying the feeling that they do not differ from the rest but are members of the common family of mankind.

To be protective is a human instinct which causes the adult to put an arm around the shoulder of a child and leads the physician to do the same to a blind person. Yet it is not hard to understand that this and similar friendly gestures may offend the dignity of the blind person and make him feel inferior.

Of great importance is care of the blind after the school age. The club room idea is a good one, with its possibilities of games especially adapted and books in Braille. It should not be difficult to obtain in each large city, from some philanthropist or philanthropic organization, a gift providing for these purposes.

For the bigger problem of how to carry the education of these people beyond the school period, much machinery seems necessary, and the question of employment in competition with those of useful vision is one to which organizations for the blind have devoted ceaseless thought. Much has been accomplished but much remains to be done. To dole out charity to the sightless and to let them hear themselves referred to as handicapped is intensely foolish and unkind. That they may be received as equals and may be trained to earn a living in a competitive world are the ideals to be kept in mind.

All who work with the blind understand how essential it is that the attitude of pity be eliminated in dealing with them, and that they may become imbued with the spirit of self-help, but we have not yet succeeded in instilling this idea into the mind of the general public.

Lawrence T. Post.

BOOKS ON OPHTHALMOLOGY

"Of the making of books there is no end". At times we may feel that there should be, for the market is glutted and unfortunately many new books are merely repetitions or else personal expressions of opinion of unsubstantial value. A book on any phase of ophthalmology should not simply reflect the author's opinions unless such opinions have been firmly sustained and widely recognized. For the advancement of a new theory current journals should be utilized and in a book should appear only established facts.

There seems to be room for five types of book in ophthalmic literature, with a separate function for each one. First stands the encyclopedia, of which class Casey Wood's American Encyclopedia of Ophthalmology is probably the outstanding example. This has to be voluminous, but the individual articles need not go into the minute details nor contain the exhaustive bibliographies required by certain other types. About once in twenty-five years is perhaps a sufficient frequency of appearance for a work of that sort.

Second comes the "system" or "Handbuch", dealing as a rule with clinical ophthalmology or some individual phase thereof. Shining examples of this type are Norris and Oliver's "System", the Graefe-Saemisch "Handbuch", Wildbrand and Saenger's "Neurologie des Auges", and the new "Kurzes Handbuch" of Schieck and Brückner. Such publications as these must be exhaustive in their scope. The articles must be written by men who can discuss the work and theories of others, amplifying these by their own experience, and presenting definite conclusions so far as possible. The bibliographies should be complete for the sake of future investigators, who in their publications can cite the authoritative treatises for complete lists of references to a given date.

As third in the classification we have the general textbook of ophthalmology of the sort compiled by de Schweinitz or Swanzy or Fuchs or Axenfeld. This

should be written by a clinician (or clinicians) of exceptionally wide experience, who in this way gives to his colleagues and to the student the benefit of that experience. Such a textbook should be fairly thorough and should cover from six hundred to a thousand printed pages. It should be too exhaustive for the undergraduate student to use as a text but should be purchased by him for reference work and for help in his subsequent general practice. It should be eminently practical and should be so indexed and arranged that the subject matter is readily accessible. If it finds public favor, it will need revision every four to seven years.

As fourth in the list comes the specialized text, such as Friedenwald's "Pathology" or Elliot's "Glaucoma" or Grout's "Surgery". The size of the book will naturally vary with the scope of the subject, but it must cover that one subject as thoroughly as is done in the system or handbook. The author's personal views, if they have found more or less general acceptance, may be enunciated and stressed, but not to the exclusion of counterarguments. Since such a book is designed for the practicing and reading ophthalmologist to whom the bibliography of the system or handbook is available, the literary references need not be exhaustive, but merely sufficient to cover special questions.

Lastly comes the ophthalmic text for the undergraduate medical student, of which Charles May's book has been for years the most popular example. One may urge that this volume is more complete than is really advisable for its particular purpose. With the limited number of curriculum hours that can be given to ophthalmology, is it not far wiser to try to drive home the few ophthalmic essentials that a man in general practice will require than to spread over him a thin veneer of contact with the whole field of ophthalmic knowledge? Much credit is due to German ophthalmologists for their leadership in the making of reference books on ophthalmology. *Harry S. Gradle.*

BOOK NOTICES

Dedication of the Wilmer Institute, Ocober 15 to 16, 1929, including addresses by E. Fuchs, G. E. de Schweinitz, and Sir John Herbert Parsons. Eighty-eight pages, published by the American Medical Association Press, Chicago, and the Waverly Press, Baltimore, 1929.

The dedication of the Wilmer Institute on October 15 and 16, 1929, is commemorated by this booklet.

A description of the dedication exercises, with a brief history of the Institute (See also this Journal, 1929, November, page 948), is followed by the three addresses delivered respectively by Fuchs, Parsons, and de Schweinitz. Fuchs's address on "Development of ophthalmology in Europe" has already been abstracted in the American Journal of Ophthalmology, 1930, June, page 563, and an abstract of the address by de Schweinitz on "Some phases and contributions of American ophthalmology" has also appeared in this Journal, 1930, June, page 565.

The address of Sir John Parsons of London on "Color vision and its anomalies" opens with a statement that any discussion of color vision is a difficult task. In the first place, what is color? It is hardly proper to define it as a mere attribute of things. Newton discovered that ordinary daylight could be broken up into the spectral colors, from which it might logically be concluded that color was an attribute of light. But the fact that the visible spectrum composes but a small part of the entire series of wave radiation is conclusive evidence that color is not an attribute of radiation. The red rays have been found to have the highest temperature, while the silver from a photographic plate is deposited most heavily by the violet end of the spectrum. In the human eye, however, ultraviolet rays will not produce electrolytic changes in the retina for any distance beyond the violet end of the spectrum, showing that the action of these waves of radiation depends not only on the nature of the radiation, but

also on the nature of the receptive medium. The electrolytic currents so set up have been proved to be a concomitant of nervous impulses, from which it follows that physiological changes in the form of nervous impulses take place in the retina, producing changes in consciousness.

Color vision is a form of perception, the result of physiologic impulses started by physical stimuli. One can, therefore, study the problem by altering the physical stimuli and observing the physiological facts. It has been found that any color between two wave lengths such as red and yellow can be accurately matched by mixing these two colors in varying proportions. As the distance between these two wave lengths is increased, the saturation becomes continuously less, until finally at a certain distance the sensation of pure white is produced. All colors in the spectrum can be produced by mixture of three colors, provided that those three colors are so chosen that neither can be obtained by mixture of the other two. That is, normal color vision is trichromatic. Helmholtz, Clark Maxwell, and Abney are the three outstanding workers on the three-components theory. This theory explains the facts of color mixture rather well; but other facts less so.

Contrast or induction may be temporal or spatial. The receptive mechanism of the retina is modified by the observation of a special color in such a way, for instance, that red and green appear antagonistic, as do yellow and blue, from which followed Hering's theory of anabolic and catabolic changes in the retina. This theory, however, fails in that it does not take into consideration the trichromatic nature of color vision.

Color blindness is of practical importance, due to the errors of those suffering from those defects in the detection of light signals and so on. About four percent of all male subjects are color blind, females much more rarely. In such cases, one of the components is absent, so that the patients are known as dichromats. In some the red and in others the green is wanting; occasionally, though much less frequently, the blue. In some cases no one component is totally absent, and such patients are known as anomalous trichromats. If the red is so affected, they are known as anomalous protanopes, if the green, as anomalous deuteranopes. It was noted by Seebeck that color matches made by people of normal vision were also valid for the color-blind, showing that no extra variable came into the process in the color-blind.

A neutral point of the trichromatic spectrum falls where the curve of blue sensation intersects the red and green component sensation curve. For protanopes this would occur at 500 microns, for deuteranopes at 515 microns. Theoretically, the variation in this point might be of diagnostic value, but they are too slight to be helpful. Occasionally, cases with monochromatic vision occur. Dr. George Wilson, of the University of Edinburgh, was the first to express the suspicion that certain railroad and shipping accidents were due to color-blind engineers and navigators. The wool test and the lantern test are about equally efficient for detection of color blindness, but the author feels that the whole subject of color-blindness and its detection are still in a far from satisfactory state of development.

M. Hayward Post.

Clinica Oftalmologica Iconografica Esquematica de Enfermedades y Anomalias. (Iconographic, ophthalmological clinic of diseases and anomalies). By M. Menacho, 428 pages, 360 illustrations. Libreria Bosch, Barcelona, Spain.

Dr. Menacho, who is Professor of Ophthalmology in Barcelona and has an extensive clinical practice, selected from his large material the most interesting cases, which he represents in many illustrations made from photographs for the outer segment of the eye and from schematic drawings by the author himself for diseases of the

fundus. He asserts in the preface of this book that his purpose was not to make an atlas for didactic purposes, but merely to put on record the most interesting or rare anomalies and diseases which he has observed in his clinic. Every case has a complete history and a résumé is made at the end of each section. In this way Dr. Menacho has saved from oblivion many cases which otherwise would never have come out of the records; an unfortunate situation which so frequently happens to busy practitioners.

Amongst the diseases of the external segment of the eye he mentions an interesting case of transparent cysts of the lids which were probably cystic adenomas; two cases of cysts of the palpebral border with inclusion of cilia, one of scleral abscess, and one of a primitive epithelioma of the cornea.

Iris anomalies are well illustrated with many drawings. The author stresses the difference between the congenital polycoria in which the different pupils have a sphincter, either muscular or fibrous, and acquired polycoria in which there are only fissures or rents in the iris tissues.

In some cases of tuberculosis of the iris the diagnosis was mostly made by the clinical appearance, the tuberculin test having been practiced only in one. In patients with iridocyclitis and gummas the syphilitic nature was also diagnosed by the clinical symptoms.

The author describes many cases of colobomas of the choroid and optic nerve and deals extensively with the different theories set forth for their development and proper interpretation.

An interesting chapter is the one dealing with the normal variations in the course and distribution of the central vessels in the retina, which is illustrated with numerous pictures showing extensive vascular anomalies. These are important from the standpoint of the differential diagnosis with pathological conditions.

It would be impossible to mention in detail the many interesting cases of retinitis, choroiditis and optic neuritis, all illustrated with good pictures of the fundus, recorded by Menacho.

Although at the time some of the patients were examined there were not such improved methods as the biomicroscope, the electric ophthalmoscope, and others, and the laboratory methods were not yet in general use, the clinical importance of the cases and the accuracy of their description makes the book interesting for those who need to study the subject.

M. Uribe Troncoso.

L'amblyopie crépusculaire, classification de ses formes étiologiques (Twilight amblyopia, classification of its etiologic forms). By Henri Lagrange, ophthalmologist of the hospitals of Paris. Octavo, stiff paper covers, 180 pages. Price sixty francs. Published by G. Doin et Compagnie, Paris, 1930.

This monograph begins with a historical study of hemeralopia, and then takes up the physiology, clinical forms, pathogenesis, and treatment of that condition. The utmost thoroughness is shown in the treatment of a subject that deserves more attention from the practicing ophthalmologist.

The term hesperanopia, meaning "no evening or twilight vision", is thought by the author to be more descriptive of the condition than the term hemeralopia which is now in common use.

Parinaud is given the credit for basic studies in this subject, and for demonstrating the rôle of the visual purple in increasing the sensitivity of the retina to the violet end of the spectrum.

The various types of apparatus for the study of the light sense are discussed in the chapter on physiology, as well as the results obtained by such examination.

The clinical types of hesperanopia are divided into major, minor, and symptomatic. Under the major type are classified the hereditary forms of Truc, Nettleship, Capion, and Oguchi, the acute forms, pigmentary degeneration of the retina, and intermediary forms.

Acute hesperanopia is described as being found in association with kerato-

malacia, liver disease, and general affections such as scurvy, paludism, typhoid fever, anemia, pregnancy, and toxemias which affect the retinal pigment layer. Epidemics of the acute form are thought to be associated with liver disease.

The literature is well reviewed, especially that concerning pigmentary degeneration of the retina.

The minor hesperanopias may be easily overlooked, but upon careful examination disturbances of light adaptation are found in cases of ametropia, unilateral amblyopia, narrowed pupils, lens changes, light injuries to the retina, and psychic disturbances. Myopic individuals frequently show a diminished light sense. Changes in stereoscopic vision are more noticeable in dim light. Fatigue and intoxication may markedly affect the light sense.

Under the symptomatic forms are found changes in light sense associated with chiasmal syndromes and hemianopia. The fact that diminution in the light sense is often premonitory of glaucoma is also mentioned.

Experimental work has shown that lack of fat soluble vitamin produces hesperanopia. It has also been found that the visual purple is attacked directly by the bile salts. Thus in disease of the liver it is questionable whether the disturbance in the light sense is caused by lack of fat soluble vitamin or by action of the bile on the pigment epithelium.

From the therapeutic standpoint the hereditary form may be controlled by warning the parents so afflicted. The acute types, due to lack of fat soluble vitamin, may be cured by cod-liver oil. Pigmentary disturbance of the retina due to syphilis should be treated specifically. *M. F. Weymann.*

National Society for the Prevention of Blindness, proceedings of the annual conference, 1929. Paper, octavo, 206 pages. Published by the Society, New York City, 1930.

This conference was held at Saint Louis, in cooperation with ten state and local organizations, including four boards and a department of the state government, the Saint Louis Public Schools, the American Legion, the Social Hygiene Association, the Saint Louis Medical Association and its ophthalmic section, beside the sight-saving class supervisors and teachers and the Missouri Association for the Blind. This association of independent organizations illustrates the influence the "National Society" is exerting for the prevention of blindness.

Ophthalmology has developed out of the struggle to relieve and prevent blindness. The pain of glaucoma, iritis, trachoma, and keratitis are reminders of the danger of the calamity of blindness. To the laity who have good vision, blindness appeals more directly and powerfully for human sympathy than does any other loss of our faculties. The amount of vision saved justifies all forms of ocular treatment, or proclaims their failure. The prevention of blindness has a wide interest for nonmedical people, as a reason for medical training and for research into the causes of disease and the means for their removal. This volume should bring home to medical men the importance and significance of their work, both those in ophthalmic practice and those who rather pride themselves that they "know nothing about the eye".

This volume is the more interesting because among those who took part in the conference were Professor Fuchs of Vienna and General Daniel M. Velez, professor of ophthalmology in the University of Mexico. Both these men have been actively interested in the prevention of blindness; and it is appropriate that portraits of them should furnish the principal illustrations of this volume. *Edward Jackson.*

OBITUARY

James McDowell Patton

Dr. James McDowell Patton, who died of angina pectoris in the morning of June twentieth, was born at Mer-

cersburg, Pennsylvania, September 24, 1876. He was the son of John Samuel and Mary Holmes (McDowell) Patton. After graduating with the degree of bachelor of sciences from Bellevue College, Bellevue, Nebraska, in 1901, he took his medical training at the University of Nebraska College of Medicine, from which he graduated in 1904. He then became assistant to Dr. Harold Gifford and specialized in ophthalmology, taking postgraduate work in

JAMES MCDOWELL PATTON, 1876-1930

London and Vienna in 1909 and later. He became professor of ophthalmology in the University of Nebraska College of Medicine in 1928. He had previously been associate professor.

Dr. Patton was the author of numerous articles in medical journals. In addition to the usual local societies, he was an active member of the Douglas County Section of Ophthalmology and Otolaryngology, of the American Ophthalmological Society, the American Academy of Ophthalmology and Otolaryngology, and the Northwest Eye, Ear, Nose, and Throat Society, as well as being a Fellow of the American Medical Association and of the American College of Surgeons. He did valuable work as a member of the American Board for ophthalmic examinations. He was president of the Douglas County Medical Society in 1921, and had been vice chairman of the Section on Ophthalmology of the American Medical Association. During the world war he served as captain in base hospital number forty-nine and was promoted to the rank of major.

Dr. Patton was greatly interested in religious and church work, being for many years superintendent of the Sunday school of the Lowe Avenue Presbyterian church, and consecutively deacon and elder of that church. He was always a willing helper in civil and social service activities, and he was a member of the board of the Presbyterian Theological Seminary of Omaha. In 1904 he married Agnes D. Hatfield. He is survived by his widow and by his one son, John Hatfield Patton.

ERRATA

On page 479 of the June issue of the American Journal of Ophthalmology, in the paper by Dr. William H. Wilmer, the statement at line twenty-three of the second column reading "On March 29, 1882" etc. should be "On March 29, 1822" etc. On page 487 of the same article, in the second line from the bottom of the second column, "Isaac Parrish" should be substituted for "Isaac Paris".

On page 646 of the July issue, in the third line of the heading of the abstract of Di Fede's article, the word "traumatic" should read "trachoma".

In the proceedings of the Section of Ophthalmology of the Royal Society of Medicine, pages 625 to 627 of the July issue, a part of the report of Mr. Ransom Pickard's paper was dropped by the printer in making up the Journal. For completion of this report see page 719 of the present issue.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education and history

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5. CONJUNCTIVA

Fernandez, J. E. **Trachoma in Venezuela.** Rev. Cubana de Oft. y Oto-Rino-Larin, 1930, v. 2, no. 1, Jan., p. 30.

While trachoma is found in all portions of the Venezuelan coast where immigrants such as Arabs, Chinese, Russians, etc., have settled, it is also present to some extent among the interior peoples who have but little communication with the coastal cities. Although there is no information regarding the time of its advent into the country, the contagion was undoubtedly of foreign origin, and was brought in by immigrants.

The infection seems to be spread by two means. The first and more important way is by flies that mechanically transmit the contagion from diseased to normal eyes. The second and less important method is by fomites such as towels and handkerchiefs.

In Venezuela, the trachomatous infection seems to differ from that typical of northern Africa in that its period of secretion is shorter and less violent, while the granulations are more marked. Also, in those adequately treated, the cicatricial stage does not produce such severe disturbances of vision. In some manner as yet unexplained, the climatic or telluric conditions peculiar to Venezuela seem to affect the invading virus adversely, for the disease is largely self-limited both among the natives, and foreigners who arrive in an active stage. It is also noted that all types of conjunctivitis seem to yield readily to medication.

The treatment routinely employed consists of applications to the conjunctiva of one percent bichloride of mercury solution upon cotton, after the lids have been anesthetized by injections. Only one eye is treated at a time, the other being cared for after an interval of ten days. Following this bichloride application there occurs a sharp inflammatory reaction that at times becomes intense, but which fades slowly under the application of compresses moistened with five percent sodium sulphate. When the conjunctiva has returned to normal, ten percent copper sulphate solution is applied every three days.

The bichloride applications can be repeated when necessary if the conjunctiva seems to be still affected. Complications of the cornea offer no impediment to this form of treatment, in fact they are but another indication for its use. When all trachomatous signs and symptoms have subsided, the lids are painted with twenty percent argyrol solution three times a week, and lightly washed each morning with five percent sodium sulphate.

A. G. Wilde.

6. CORNEA AND SCLERA

Wright, R. E. **Superficial punctate keratitis.** Brit. Jour. Ophth., 1930, v. 14, June, p. 257.

This is a record of an epidemic of superficial punctate keratitis which appeared in Madras about May, 1928, and continued during the year that followed. The record embodies observations relating to the clinical appearance, biomicroscopy, epidemiology, etiology and histopathology of the disease, based on the investigation of over 900 cases.

Superficial punctate keratitis was described independently by Adler, Carion, Reuss, and Fuchs, and in its more usual aspects, it has been recognized clinically since that time. This exhaustive study incorporates histories of twelve individual illustrative types of the disease. A discussion of the epidemic form, corneal microscopic observations, human and animal experimentation with filtered and unfiltered epithelial pulp, together with tables showing results, are presented. This study of the disease shows the greatest diversity in the lesions of the cornea. The animal experiments support the bacteriological and histopathological findings and the clinical features of the disease, and point to the etiological agent being a specific filter-passing virus. *D. F. Harbridge.*

7. UVEAL TRACT, SYMPATHETIC DISEASE AND AQUEOUS HUMOR

Wood, D. J. **Two cases of sympathetic ophthalmitis.** Brit, Jour. Ophth., 1930, v. 14, June, p. 291.

Within the past year the author has had two cases of sympathetic disease; these together with one reported in 1927 form an interesting trio. The second case of the trio was a boy who was injured by a piece of wire. The prolapsed iris was excised. Two weeks later the iris changed color and the tension lowered, but no deposits formed on the cornea. The eye was excised. Two weeks after this he returned with failure of vision in the remaining eye, deposits had formed on the back of the cornea, and there were some iris adhesions. He was put under active treatment for a year, after which there was almost complete iris adhesion, and many deposits on the lens capsule. Congestion of the retinal vessels and blurred optic nerve outline were observed.

The third case was in a woman aged fifty-three years who had had an injury when a child, causing an eccentric pupil. She was successfully operated for cataract. About ten weeks later she presented, in the fellow eye, an iridocyclitis, precipitates on the cornea, and dim vision. Some months later the eye was removed. Wood gives an exhaustive pathologic study of the two specimens accompanied by twelve fine photomicrographs.

The two cases are apparently the two extremes of what we know as sympathetic disease. In one the inflammation is of the septic type, characterized by leucocytic extravasation, and some lymphocytic collections; in the other the characteristic features are the absence of leucocytes, with some lymphocytic collections and much plasma cell formation. The common type shows mainly lymphocytic nodules.

D. F. Harbridge.

8. GLAUCOMA AND OCULAR TENSION

Golowin, S. S. **Investigations of the subvital processes in the isolated eye.** Zeit. f. Augenh., 1930, v. 70, Feb., p. 265.

The author calls his studies of the reactions of the perfused isolated eye "investigations of subvital processes", by analogy to the subcortical or subconscious activities of the nervous system. Addition of eserine, pilocarpine, histamine and adrenalin to the perfusing Ringer's solution reduced the outflow of fluid from the eye, and also reduced the intraocular tension. After a period of an hour or more, the number of drops of fluid which escape from the eye is still further reduced and the tension rises. The effects of atropin, caffeine, and cocaine were not so constant nor so striking. The reduction of tension associated with contraction of the blood vessels demonstrates the importance of the vasodilators in the

pathogenesis of glaucoma. Perfusion with fluid containing a dye demonstrates the absence of currents in the vitreous and lens, but shows that there are movements of the aqueous in anterior and posterior chambers which originate at the ciliary body. The aqueous seems to leave the eye by way of the veins of the anterior segment. Many experiments with the regulation of the intraocular tension are detailed. There are some contradictions in the results, but in general the belief seems justified that one of the functions of the vessel walls is to regulate intraocular tension by neutralizing any variation from normal.

F. H. Haessler.

Krasso, Ilona. **The psychic influence in the production of intraocular pressure.** Zeit. f. Augenh., 1930, v. 70, March, p. 355.

In a young neurotic woman, increased intraocular tension occurred with any attempt to read, and was noted by the patient because of the usual subjective phenomena. Despite the fact that this has occurred for six years the visual acuity and the fields have remained normal and the optic nerve head has not become excavated. The patient was most exhaustively and painstakingly studied. The rise in tension is independent of accommodation, convergence, and pupillary diameter. One hour in a dark room causes a rise in pressure. Reading does not cause a rise in pressure when the eye is under the effect of eserin, atropin or adrenalin, nor does staying an hour in darkness under these conditions. The effect of darkness as well as the massage test are independent of the size of the pupil, as are the daily variations in tension. The findings suggest that the inflow and outflow of intraocular fluids are normal. The general medical and psychiatric studies suggest that a vasomotor hyperirritability is present.

F. H. Haessler.

Sédan, Jean. **Evolution of four spontaneous fistulæ after iridectomy for acute glaucoma.** Ann. d'Ocul., 1930, v. 167, April, pp. 307-310.

These fistulæ developed within a few days after the operation, and served successively as filtering cicatrices, in some cases for many years. They were regarded as fortuitous accidents.

Lawrence T. Post.

9. CRYSTALLINE LENS

Butler, T. H. **Lenticonus posterior; report of six cases.** Arch. of Ophth., 1930, v. 3, no. 4, April, pp. 425-436.

Lenticonus posterior is very rare, occurring in from about one to four times in one hundred thousand cases. It is frequently associated with other anomalies of the lens, such as anterior or posterior polar cataract. With the ophthalmoscope, it appears as a cup-shaped bulging of the posterior capsule. With the slit-lamp, it can be seen as a definite protuberance of the posterior capsule and concentric condensation lines, or as a normal curvature of the capsule with bulging only of the condensation lines. In this latter case, there is frequently a forward projection of the condensation lines in the center of the cup. There is also a "collar-stud" opacity in the interior of the lens, with its top pointing into the conus, but never in contact with the lens capsule. In one case this opacity was seen with the slit-lamp to be trumpet-shaped at the top and four lobed at the base. The term "trumpet-shaped" was applied to it by Vogt in his atlas.

There is no satisfactory embryological explanation. The condition, in the opinion of the author, is a pure aberrance. It takes place during the sixth or seventh month, as both the anterior and posterior Y's are unaffected. The collar-stud opacity may be due to the inclusion of some abnormal material in the suture, or possibly it may result from abnormal pressure on the capsule without inclusion. A persistent hyaloid was seen only once, which, taken together with the failure of the bulge to be located below and to the nasal side, argues against the former theory that traction by this membrane was responsible for the malformation. Nor does the theory of rarefaction of the capsule appear justified, for no such thinning can be

made out. Two of the cases reported occurred in father and son, suggesting an hereditary factor. *M. H. Post.*

Weeks, John E. **Cause of cataract, and nonoperative treatment of incipient "senile" cataract.** Jour. Amer. Med. Assoc., 1930, v. 94, Feb. 8, pp. 403-407.

The author reviews the known causes of cataract and the nonoperative method of treatment, and adds one method of his own which he has used for thirty years. His therapy is based on the theory that spontaneous cataract is due to nutritional irregularities and hence a lack of proper pabulum for the lens. Three cases are reported to support this theory. A mixture of equal parts of a solution of three percent boric acid and glycerin instilled into the conjunctival sac once or twice daily produces hyperemia, which is supposed to increase the nutrition of the anterior segment of the eye and of the lens. The reports of 1,012 eyes so treated are summarized; the average time of treatment and observation was 5.53 years, the shortest time being one year, and the longest period of observation twenty-seven years. The results are analyzed according to the vision at the beginning of treatment and the number of eyes, and length of time in which vision changed or the cataract matured. The results are encouraging. The types of cataract observed and some of the complications encountered are also listed. The importance of a general physical examination and correction of conditions detrimental to health is emphasized. (Discussion.)

George H. Stine.

10. RETINA AND VITREOUS

Junius, P. **The conceptions regarding inflammation, and their application to disease of the center of the retina.** Zeit. f. Augenh., 1930, v. 70, March, p. 335.

The author quotes many opinions, chiefly of pathologists, as to the essential nature of inflammation and discusses the importance of a knowledge of inflammation in order to understand central retinal disease. The intricacies of angiomatosis of the retina are also briefly mentioned. *F. H. Haessler.*

Majewski, K. **The pathogenesis of retinal detachment in high myopia.** Klinika Oczna, 1929, Dec., pp. 129-140.

The author discusses in detail mechanical factors in the pathogenesis of retinal detachment. Distention of the sclera and choroid in high myopia can hardly be accompanied by a corresponding stretching of the nonelastic retina, hence the predisposition to retinal separation. Mathematical calculations are presented to prove that a retinal detachment is more likely to occur in spherical distention of the eyeball than in regional ectasia of the sclera (true posterior staphyloma).

M. Beigelman.

Patwardhan, D. G. **An unusual case of neuroepithelioma of the retina.** Brit. Jour. Ophth., 1930, v. 14, June, p. 297.

A boy six years old had received a perforating injury of the left eyeball six months previous to observation. One or two weeks after healing, a swelling appeared at the point of injury which gradually increased during the ensuing six months until it attained the size of a cocoanut. Pathologic examination showed a neuroepithelioma of the retina. (Two photomicrographs).

D. F. Harbridge.

Reiger, Herwigh. **A case of medullated nerve fibers of the papillomacular bundle, with high myopia and changes in the macula.** Klin. M. f. Augenh., 1930, v. 84, April, pp. 517-522.

In an otherwise healthy girl of eleven years, both eyes presented a perfectly symmetric alteration of the papillomacular bundle, which, on account of its gray silvery glistening appearance and its finely striated structure, the author regarded (in accordance with a case described by Brückner in 1905), as medullated nerve fibers of the papillomacular bundle. The simultaneous changes in the macula, alterations of the pigment epithelium at the periphery, intense concentric contraction of the visual fields, and diminished light

sense suggested degenerated processes in the sense of a tapetoretinal degeneration rather than atrophy due to myopic tension. *C. Zimmermann.*

Rubbrecht, M. R. **Closing retinal tears.** Bull. Soc. Belge d'Opht., 1929, no. 59, p. 15.

The author describes at length and with illustrations his method of localizing the retinal tear in detachment of the retina and his operative technique in cauterizing the tear. As the purpose of the operation is to cause an adhesive inflammation which shall fix the retina to the choroid he maintains that it suffices to limit the thermic actions to these two membranes and is not necessary to plunge the cautery into the vitreous according to the technique of Gonin. In discussion Coppez characterized the method of Rubbrecht as ingenious and his results as excellent: it appeared to conform more closely with sound surgical principles than did the drastic technique of Gonin.

J. B. Thomas.

Sladden, A. F. **A case of Lindau's disease (capillary angiomatosis).** Brit. Jour. Ophth., 1930, v. 14, May, p. 224.

Twenty years before the present observation this case was reported by Thomas and Coats in the Transactions of the Ophthalmological Society of the United Kingdom as "a peculiar granuloma of the retina". This retinal tumor necessitated removal of the eye.

At the time of the present observation the patient was thirty-seven years of age. He gave a history of having received a severe head injury five years previously. Subsequently he suffered headaches, which latterly became intolerable. A provisional diagnosis of cerebral tumor was made. At autopsy two small soft tumors were found in the cranial cavity and two growths in the left kidney. Histological examination showed the growths to be angiomatous. To summarize: A case of Lindau's disease, with capillary angiomata of retina, cerebellum and kidney, is described. The retinal growth had been removed twenty years previously. The cerebral compression arising from the intracranial tumors became more manifest after a blow on the head five years before death. There was some evidence of faulty development of the skull. No history was obtained of similar conditions in the man's family. (One eye section, four photomicrographs, and ten references.)

D. F. Harbridge.

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Edmund, C. **Congenital colobomatous groove formations in the optic disc.** Acta Ophth., 1930, v. 8, p. 56.

The author reports two cases and discusses the embryological development. *Ray K. Daily.*

Herzog, Max. **Hereditary, congenital optic atrophy.** Klin. M. f. Augenh., 1930, v. 84, April, pp. 536-543. (2 ill.)

The optic atrophy could be traced through three generations: maternal grandmother, mother aged thirty-seven years, and son aged eight years. It seemed to be hereditary and congenital, although absolute proof of this could not be given. The affection seemed not to be of a sex-linked, dominant type. Its differential diagnosis from Leber's hereditary atrophy and from Behr's complicated familial atrophy in childhood is set forth in detail.

C. Zimmermann.

12. VISUAL TRACTS AND CENTERS

Safar, K. **Visual disturbances indicating hypophyseal tumors.** Wien. klin. Woch., 1929, v. 42, Dec., p. 1604.

Visual disturbances are often the first symptoms of hypophyseal disturbance, appearing before the endocrine symptoms.

Bitemporal hemianopsia is the most characteristic symptom. It may be outlined with colors or small white objects. Bitemporal scotomas may be found early; optic atrophy later. Choked disc seldom occurs, unless the condition is associated with an internal hydrocephalus. Paralysis of the ocu-

lar muscles is seldom found in this condition. *Beulah Cushman.*

13. EYEBALL AND ORBIT

Barrada M. A. **Causes of proptosis and enormous distension of the orbit.** Bull. Ophth. Soc. of Egypt, 1929, v. 22, pp. 29-59.

In ordinary practice an ophthalmologist will see very few of these cases and for a general understanding of them must depend on his reading of cases reported by others. From his experience in Egypt, Barrada reports a varied group of them. Bilateral exophthalmos is represented by a case of oxycephaly; and Graves's disease, uremia, lymphoma and hypernephroma had to be considered. In one case orbital cellulitis with edema of the lids began on the right side, and later migrated to the left side. In a boy of fifteen years orbital cellulitis followed epistaxis and diffuse opacity of the maxillary antrum. The displacement and edema were excessive in comparison with the inflammatory symptoms. A case of atypical cellulitis followed an ulcer of the conjunctiva in which staphylococci were found. Three cases of ethmoidal mucocele are reported; and two frontal mucocele. There was a malignant tumor of the orbit, one of hemangioma, and one of gumma of the orbit.

For orbital cellulitis Barrada accepts the following etiological classification of MacCallan, which is the more important because treatment depends so largely on etiology: (1) injuries; (2) primary osteomyelitis; (3) acute dacryoadenitis; (4) spread of inflammation from neighboring parts as in (a) panophthalmitis, (b) cavernous sinus thrombosis, (c) infected wound or abscess of face or eyelid, or erysipelas, (d) acute pharyngitis including scarlet fever, (e) acute periodontitis and maxillary periostitis, (f) infection of the accessory sinuses, (g) tuberculous meningitis, (h) acute dacryocystitis; (5) septicemic conditions; (6) syphilis and tubercle; (7) orbital myiasis, aspergillosis, and actinomycosis.

The diagnosis of proptosis rests on a wide range of data. The history must be very thoroughly investigated. Pulsating exophthalmos may take some time to develop after injury to the internal carotid; and sudden exophthalmos in children may be due to an unrecognized injury or spontaneous hemorrhage into the orbit. The protrusion must be investigated with reference to its direction, form, pulsation, feel, tenderness, and evidence of inflammation. The Wassermann reaction, rhinological examination, x-ray opacities, neurological examination, tuberculin tests, aspiration, exploratory operation, and microscopic examination of tissue, may all be needed to settle the diagnosis. The thirteen illustrations reproduce photographs and radiograms of the cases reported. *Edward Jackson.*

Doggart, J. H. **A case of buphthalmia with normal unaided vision.** Brit. Jour. Ophth., 1930, v. 14, May, p. 229.

A boy aged ten years had been under observation for over a year, during which time the eyes showed no change. The cornea had a diameter of 13.5 mm. Tension, field and vision were normal. The left eye showed a deep physiological cup. A paternal uncle of the mother had a son whose four children all had very large, normally functioning eyes. The question of classifying these cases as megalophthalmos or buphthalmos is discussed. The author prefers the latter. *D. F. Harbridge.*

Fuchs, Ernst. **Consequences of softening of the eyeball.** Arch. of Ophth., 1930, v. 3, no. 4, April, pp. 419-423.

Softening of the eyeball may occur suddenly or slowly, and the results vary accordingly. In young people considerable softening may result only in general shrinkage of the globe, with increased filling of the intrinsic vessels, mostly of the choroid. In old age, the posterior layers of the cornea fold, producing keratitis striata. The anterior portion of the sclera may assume a square shape, or even a bale shape, due to pressure of the recti.

In chronic softening, permanent folds appear in both the cornea and sclera, the former frequently showing grey lines and later becoming thicker than normal. The sclera may develop a permanent fold behind the insertion of the recti. The iris moves backward or forward, depending upon whether the greater diminution has taken place in the vitreous or aqueous chambers. In the former case, a circular step may be observed, the periphery of the iris lying in a posterior plane.

Sudden softening may result in hemorrhage from the iris and ciliary body or in detachment of the choroid, the latter usually being transitory. Occasionally, this detachment pushes the choroid and retina as far as the sagittal axis of the eye, where it can be observed with focal illumination as a brown, round prominence. The sclera first pressed in resumes its natural shape, sucking serum from the vessels of the choroid, which fills the space between the sclera and choroid. Hemorrhage may also occur. This is especially marked if a long posterior ciliary artery ruptures, and frequently results in loss of the eye. Occasionally, the lens ligaments are torn and the lens is displaced. Detachment of the retina is a comparatively rare occurrence, due to the closer application of the smooth, moist surfaces of the choroid and retina, as compared to the loose attachment of the former with the sclera by the lamellæ of the suprachoroidal membrane. In sudden softening, the choroid and sclera shrink, but the less elastic retina fails to follow them and folds appear in its external layers.

An edema of the optic nerve occasionally takes place, due to alteration between intraocular and intracranial pressure. This edema may mask cupping of the disc for a short time.

M. H. Post.

Goes, Mario. **Primary melanosarcoma of the orbit.** Annaes de Ocul. do Rio de Janeiro, 1929, v. 1, Oct., pp. 18-22. (3 ill.)

A brief discussion of the rarity of this condition precedes the presentation of a case. After careful differential diagnosis, the tumor mass was removed by the method of Krönlein with a slight modification introduced by the author. Microscopic sections revealed a melanosarcoma. One month after the operation visual acuity increased from about 3/200 to 8/200, all exophthalmos disappeared, and muscular action returned to normal. Three photographs are reproduced to show the condition before and after operation. *Hugo Lucic.*

Lazarescu, D. and Lazarescu E. **Three cases of traumatic pulsating exophthalmos.** Brit. Jour. Ophth., 1930, v. 14, April, p. 162.

Case one was in a male, aged fourteen years, who had received a bullet wound in the left orbit two months previous to first observation, the bullet lodging in the occipital region. The patient complained of a mill-like noise in his head. The eye was proptosed thirty mm., later thirty-three mm. A loud bruit was heard at the left temple which was stopped by compression of the carotid. The cornea was opaque and ulcerated. A diagnosis of pulsating exophthalmos due to arteriovenous aneurism was made. Operation was refused.

Case two was in a male aged thirty-four years who had received a severe head injury two years previous to observation. He complained of severe headache, facial palsy, diminished hearing, and a windy noise in his head. The right eye was proptosed twenty-one mm. and the visual field was diminished thirty to fifty degrees. The right internal carotid was ligated and the bruit disappeared, reducing the exophthalmos to thirteen millimeters.

Case three was in a male aged nineteen years who fell four meters, landing in an upright position, thus injuring his left eye by contrecoup. The exophthalmos measured nineteen mm., the bulbar conjunctiva was injected, movement was good and vision was 1/3. There was a marked bruit in the left temple region, controlled by compression of the carotid. When the left carotid was ligated the head noise

ceased and the exophthalmos measured 15 mm. Four days after the operation there was a slight right hemiparesis.

The exophthalmos appeared immediately after the trauma in the first and third cases and after twenty days in the second. Pulsating exophthalmos may occasionally be due to tumors, but the most common cause is injury. Local anesthesia seems to be the best form of narcosis for these cases. (Four illustrations, thirty-two references.)

D. F. Harbridge.

Leonardi, E. **Ocular fundus of the dog.** (Experimental research.) Ann. di Ottal., 1930, v. 58, Jan., p. 18.

These studies were made in the clinic of Professor Ovio, whose investigations of the eyes of animals are widely known. The eyes of one hundred animals were photographed and wide differences were found not only between the different breeds but also among individuals of the same families. Instantaneous photography was not attempted but the animal was narcotized with a preparation of chloral and morphia, and the pupils dilated with atropin. The lids were held apart by an assistant and the focus obtained by the Gullstrand ocular with the nitra lamp and suprarapid panchromatic plates. The exposure was about forty seconds. Variations were found in the color of the tapetum, the situation and the form of the papilla, and the character and disposition of the retinal vessels. The Gullstrand ophthalmoscope gave images absolutely devoid of reflections. (Bibliography.) *Park Lewis.*

Levine, Joseph. **Metastatic bacillus coli panophthalmitis from calculus pyonephrosis.** Arch. of Ophth., 1930, v. 3, no. 4, April, pp. 410-412.

Panophthalmitis from bacillus coli infection is extremely rare, and endophthalmitis from nephritis has never been reported. Experimental work by Selenkowsky and Woizechowsky has shown that bacteria could be introduced into the vitreous from blood vessels in the posterior part of the eye, and that with severe general infection of the blood stream, bacteria could be recovered in the vitreous. But in cases of injury to the eye, bacteria were found in the vitreous following even mild infections. Bacterial entrance was most easily facilitated by injury to both the anterior and posterior portions of the eye. Injury to the anterior portion was least favorable.

The process often begins in the ciliary body. One case is reported in which a pure culture of bacillus coli was recovered from the vitreous, and also from a catheterized specimen of urine. *M. H. Post.*

Moers, P. **Phlegmon of the orbit and diathermy.** Bull. Soc. Belge d'Opht., 1929, no. 59, p. 11.

The author reports a case of orbital phlegmon treated by incision with the diathermic knife. The advantage of this method is that the pus is evacuated without opening blood vessels or lymphatics, which are instantly sealed by the coagulation induced by the so-called cold cautery. Thus one avoids the danger of propagation which exists in the ordinary incision with the bistoury. A second advantage is that the diathermy incision produces sterilization not only along the line of incision but extending into the tissues a certain distance from the point of application.

J. B. Thomas.

Penman, G. G. **A case of bilateral buphthalmos with multiple congenital abnormalities in one eye.** Brit. Jour. Ophth., 1930, v. 14, May, p. 232.

A male, aged six years, showed the ordinary features of an advanced buphthalmos of the right eye. In the left eye there was in addition almost complete aniridia, a rudimentary iris showing as a dark brown rim. At 11:00 o'clock a wider piece of iris appeared; from its anterior surface a strip of white anterior vascular sheath remnant, with some vessels on its surface, ran to the center of the anterior surface of the lens. Below the lens presented a double coloboma and the suspensory ligament was absent in this region.

Trephining benefited the right, but not the left eye. (One illustration)

D. F. Harbridge.

Schindler, Emma. **Bone tuberculosis of the orbit in the aged.** Zeit. f. Augenh., 1930, v. 70, March, p. 385.

The author reports two cases of tuberculous periostitis in women over eighty years of age. At this age the danger of disseminating the infection by surgical intervention is not great. Operative procedure greatly shortens the course. In the young, conservative treatment with light and Roentgen rays as well as fresh air is advisable.

F. H. Haessler.

Weekers, M. **Treatment of painful eyes that retain vision, by orbital injection of weak solutions of alcohol.** Bull. Soc. Belge d'Opht., 1929, no. 59 p. 49.

In blind eyes in which severe pain forces one to consider enucleation one succeeds at times in preserving the globe and alleviating pain by using orbital injections of concentrated alcohol (80 percent). Weekers sought to utilize this favorable action of alcohol, though it might be temporary, in progressive ocular infections accompanied by severe pain. In the author's experience even strong (80 percent) injections of alcohol had no bad influence on the optic nerve, which he maintains is protected by its system of sheaths. He was encouraged by this observation to make orbital injections of weaker alcoholic solutions in painful eyes with good vision, beginning with five to ten percent and increasing to a maximum of forty percent. He injects one c.c. novocaine two percent, leaves the needle in place, and in a few minutes injects slowly one c.c. of alcohol solution. The needle is 3.5 cm. long and the point must reach the center of the orbit. His results are excellent. A slight diminution of sensibility of the cornea may obtain for a day or two but no harm to the cornea has followed. Such injections should be reserved for ocular troubles with severe and persistent pain in which the usual analgesics fail; e.g., traumatic lesions, torpid ulcers of the cornea, corneal herpes, neuralgic and filamentous keratitis, scleritis, and especially hypertensive iridocyclitis. The relief from pain gives the patient ease and allows the doctor time to develop his course of treatment. One may have to repeat the injection or perhaps increase the concentration of alcohol. In iridocyclitis with hypertension the injection relieves the pain and also decreases the tension notably; other objective symptoms are unchanged and the tension as a rule rises again in one or two weeks.

J. B. Thomas.

14. EYELIDS AND LACRIMAL APPARATUS

Adrogue and Alvarado. **Anomalies of lid pigmentation.** Arch. de Oft. de Buenos Aires, v. 4, no. 12, p. 736.

This lengthy article constitutes a complete survey of pigmentary changes that may occur in the lids. These changes may be due to derivatives of hemoglobin, of fat, or of melanin. Disturbances of pigmentation may exist either as an excess or absence, and can be congenital or acquired; examples of these are melanism, tattooing and argyria, ichthyosis nigra and seborrhea nigricans, pityriasis versicolor and scabies.

Abnormalities of melanin distribution include congenital albinism, vitiligo, and leucoderma, common freckles, chloasma, and ochronosis. The various types of melanodermias may be divided into subgroups from the standpoint of either their cause or pathology. Those arising from general infections are seen in tuberculosis, lues, or Addison's disease. The toxic types are found in arsenical poisoning, alcohol, or pediculosis. When considered from their pathology, we find them in endocrine or sympathetic disturbances of the nervous system, or abnormalities of metabolism.

In addition to the above there are the acquired types of dicromatic dermatoses such as Recklinghausen's disease, xeroderma pigmentosum, acanthosis

nigricans, the various sclerodermas, pigmented urticaria, etc. The congenital pigmentations constitute the various types of nevi.

In the article each of the above classifications and disease entities is discussed in detail, followed by an extensive bibliography from German and French sources. Treatment is omitted. *A. G. Wilde.*

Agnantis, Const. **Autoplastic operation on lid and eyebrow.** Ann. d'Ocul., 1930, v. 167, March, pp. 226-229.

The author describes with illustrations his method of splitting one eyebrow and transferring it with a skin flap to replace the missing brow on the other side. He completes the operation with a dermal insert into the upper lid. *Lawrence T. Post.*

Aubaret, E. **Etiology and treatment of blepharitis.** Bull. Soc. Franç. d'Opht., 1929. p. 1.

Aubaret has reviewed in detail the history, anatomy, classification, etiology and treatment of the blepharitides in a report presented before the French Society of Ophthalmology. He stresses the fact that the blepharitides are dermatoses, comparable with those of all hairy and orificial regions, and should be classified dermatologically. Consequently there should be close cooperation between the ophthalmologist and the dermatologist in the study and treatment of these conditions.

The great variety of etiological factors makes the treatment extremely complicated. Aubaret outlines three principal types of therapy. The first is the prophylactic and hygienic treatment designed to prevent blepharitic manifestations in subjects particularly predisposed; the second is the local treatment, directed against the local causes and symptoms of the disease; and the third is the general treatment intended to improve the general resistance and to remove systemic causes.

The author believes that vaccines have a definitely assured future in the treatment of infected blepharitides. *Phillips Thygeson.*

Berg, F. **The influence of the lids on the corneal curvature.** Acta Ophth., 1930, v. 8, p. 1.

The author describes and illustrates with graphs the anterior corneal curvature, which he studied with his own modification of the Javal-Schiøtz ophthalmometer. He finds that the cornea is fairly spherical in the center and flattens toward the periphery. The horizontal meridian is regular, while the vertical is quite irregular due to the abrupt flattening of the cornea, usually above and sometimes also below. During skiascopy this variation in the corneal surface is manifested as a difference in refraction. If the patient is directed to look down and the upper lid is lifted, there may be frequently seen skiascopically, particularly in young people, a fine line on the corneal surface, corresponding to the lower border of the upper lid. Gullstrand believes that this line is caused by pressure of the lid. The line is usually outside of the pupillary area and has no bearing on visual acuity. Occasionally it may be in the pupillary area and cause disturbance of vision and asthenopia; in such cases Miyashita observed monocular diplopia. *Ray K. Daily.*

Bernd, Willi. **Bilateral aplasia of the first branch of the fifth nerve, with retained secretion of tears.** Klin. M. f. Augenh., 1930, v. 84, April, p. 531.

A girl aged nine months showed a slight diffuse opacity of the left cornea, with a round deep central ulcer extending toward the lower temporal quadrant. This healed within three weeks, leaving a macula. At the age of eight years she returned with a similar affection of the right cornea. Both corneas were anesthetic, and upon directly touching the cornea and conjunctiva the secretion of tears was not increased, although the child could weep when in distress. Irritation of the nose produced a flow of tears, as shown by Schirmer's experiment. The area of the skin supplied by the first branch of the fifth nerve was also anesthetic. The facial nerve was intact on both sides.

The paradoxic phenomenon of persistence of abundant secretion of tears with anesthesia of the first branch of the fifth nerve must be due to the fact that the secreting fibers of it are not affected or that the secretion of tears is governed by the facial nerve through the great superficial petrosal nerve. In this case the bilateral affection was not central, but peripheral, being due to the rare congenital aplasia of the first branch of the fifth nerve. The parents were advised to keep the child under constant supervision by an ophthalmologist, to have her wear closely fitting eye pads, and to apply liquid neutral paraffin to prevent desiccation.

C. Zimmermann.

Bichelonne, H. B. **Temporary prothesis in ankyloblepharon.** Bull. Soc. Franç. d'Opht., 1929, p. 181.

Bichelonne reviews the work of Kaz of Leningrad, who has obtained encouraging results in total ankylosymblepharon by the use of a celluloid prothesis after dissecting free the adhesions. The prothesis is very thin and is designed to cover the entire anterior segment of the eye, being held in place by suction. Rather marked visual improvement has followed its use in various types of corneal opacity such as those due to trachomatous xerophthalmia. It also acts favorably as a resorbent in parenchymatous keratitis. Bichelonne suggests that a glass design of prothesis would be better tolerated than celluloid, which after a certain period is acted upon chemically by the body fluids to produce irritating substances. *Phillips Thygeson.*

Fernandez, Juan E. **Polyadenitis of meibomian glands in the four lids.** Maracaibo, Venezuela (reprint), 6 pages, 1929.

Fernandez reports a case of inflammation of the whole row of meibomian glands in the four lids of a child, three months old. There was complete ptosis due to an inflammatory edema, with thickening of the upper lids. Above the lid borders, noticeable to the eye and still more to palpation, there was a hard cord extending the whole length of the lid. The tarsal conjunctiva was thickened and reddened and at the site of the meibomian glands appeared many small elevations of a red color, some of them with a yellowish spot of suppuration, others with a crater-like depression, and still others with papillomas emerging from the openings. A moderate mucous discharge was present. The father of the child having a history of syphilis, antiluetic treatment was started, but did not prove successful. Fernandez then used intramuscular milk injections, applications of silver nitrate, and excision or expression of the glands. This treatment gave immediate results and at the end of four weeks the child was cured.

The author refers to a similar case described by Kalt in one adult affected with syphilis, in which specific treatment was of no avail, the pathogenic germ being the staphylococcus.

M. Uribe Troncoso.

Ferrer, Horacio. **Dacryocystitis neonatorum.** Rev. Cubana de Oft. y Oto-Rino-Larin., 1930, v. 2, March, p. 183.

This condition is seen either at birth, or a short time thereafter, as a suppuration that fails to respond to the usual treatments of conjunctivitis. Inspection shows the conjunctiva either entirely free of inflammation, or not inflamed to a degree corresponding to the amount of secretion present. When the sac is compressed, pus appears at the punctae. Difficulty in controlling the child and meddlesome interference on the part of the parents are factors often retarding the diagnosis.

While stenosis may occur at any of the folds found in the nasal duct, it is most liable to involve the lower ends. This is at times occluded by a thin congenital membrane, that may be easily ruptured mechanically, but still strong enough to offer complete resistance to the passage of tears.

This drainage system probably assumes its function when the child cries and sheds tears for the first time. If the membrane persists the stagna-

tion of tears and other secretions causes an infection that within a few days can set up a veritable dacryocystitis. This at times becomes relieved by spontaneous rupture of the membrane, but usually if the membrane is not opened mechanically it remains impermeable throughout life.

Spontaneous cures are seen so seldom that they should never be relied upon. The method par excellence for relief is probing, and any other method is largely a waste of time. Antiseptic injections should be reserved to clear any suppuration that may persist after the passage has been mechanically opened. It has been noted that high pressure of liquids from too vigorous syringing is also capable of tearing the lining membrane. One passage of a sound is usually sufficient. *A. G. Wilde.*

Panico, E. **Acute bilateral dacryoadenitis in the course of a blennorrhea.** Ann. di Ottal., 1930, v. 58, Jan., p. 59.

In the case reported, as is usual in this rare form of disease, both glands were involved. Although gonococci were present in the urethral discharge, no conjunctival secretion was present. It was not clear whether the inflammation was due to a toxin absorbed in the circulation or to bacterial infection. (Bibliography.) *Park Lewis.*

Rosenblatt, N. **Six cases of reduplication of the tear ducts.** Zeit. f. **Augenh.,** 1930, v. 70, Feb., p. 299.

This anomaly is not nearly so rare as one is led to conclude from the fact that Stock could find only one case in the entire ophthalmologic literature. In the two years that the author has paid attention to this phenomenon he has observed it nine times.

F. H. Haessler.

Vinaver, L. **The pathogenesis and pathologic anatomy of xanthelasma.** Arch. Oftalmologii (Russian), 1930, v. 7, pt. 1, pp. 53-59.

Xanthelasma is due to an accumulation of lipoids in the connective tissue, and it is usually accompanied by a general hypercholesteremia. Large cells containing droplets of fat (Schaumzellen) are described as a constant histopathologic finding in xanthelasma.

M. Beigelman.

15. TUMORS

Bakry, M. **Multiple fibromata of upper lid and forehead.** Bull. Ophth. Soc. of Egypt. 1929, p. 78.

In a man of twenty-eight years there were three tumors: a soft mass the size of a walnut above the eyebrow, which had begun since childhood; a semicystic mass under the nasal third of the eyebrow; and a hard oval tumor as big as a hen's egg, which occupied the area between the lashes and the brow, and caused pressure and pain. Neither of the first two was adherent to the bone, or caused pain. The skin of the third tumor was tense, but not adherent, and the tarsus was wholly included in the mass: this tumor had grown gradually during three years. All three were removed under local anesthesia through connected incisions, which included the redundant skin of the lid growth. The masses were examined at the Giza Laboratory and were reported to be fibromata, undergoing hyaline degeneration in some parts. After two months there was no trace of the growths, nor any recurrence.

Edward Jackson.

Duke-Elder, W. S. and Stallard, H. B. **Leucosarcoma of the iris.** Brit. Jour. Ophth., 1930, v. 14, April, p. 158.

Primary sarcoma of the iris is relatively rare but the nonpigmented type is of even greater rarity.

A man aged sixty years presented in the right eye a raised circular tumor about three mm. in diameter situated at nine o'clock. The tumor was of a yellowish-white color, vascularized, and on its surface were numerous vascular loops. A large segment of iris including the neoplasm was excised. Pathological examination showed a nonpigmented, noncapsulated neoplasm with spindle-shaped cells.

A search of the literature revealed only twenty-five reported cases; thirteen males, twelve females; the young-

est aged one year, the oldest aged seventy-five years. The growths occupied various sites and were nodular, triangular, diffuse, globular and pedunculated in shape. They were composed of round cells, spindle cells or mixed cells without pigment.

The results of treatment would seem to indicate that if the tumor is localized in the iris, removal by iridectomy can be complete. The author's opinion is that when the neoplasm is small, well defined, situated at or near the pupillary margin, tension and vision good, iridectomy is indicated. (Bibliography of twenty-five references.)

D. F. Harbridge.

Dupuy-Dutemps, L. **Papillary epithelioma of the nasal fossa secondary to a papilloma of the lacrimal sac extirpated twenty-four years previously.** Bull. Soc. Franç. d'Opht., 1929, p. 215.

In 1905 the author extirpated, because of papilloma formation, the lacrimal sac of a woman aged twenty-two years. The growth was confined to the sac, except for a few small conjunctival vegetations which were destroyed by galvanocautery. Twenty-four years after the operation the patient returned with a tumor of the right nasal fossa which extended through into the inferointernal border of the right orbit. Biopsy revealed a papillary epithelioma which corresponded closely in structure with the papilloma previously extirpated. The author concludes that the neoplasm developed from papillary remains left in the lower part of the nasolacrimal canal after extirpation of the sac.

Phillips Thygeson.

Elschnig, A. **Misinterpretation of a mass found in a roentgen plate of the orbit.** Med. Klin., 1929, v. 25, Nov., p. 1693. (Three illustrations.)

The author reports a case in which the x-ray interpretation led to a diagnosis of tumor of the orbit, but after a Krönlein incision a simple mucocele was found and opened, extending from a large posterior ethmoid cell.

Beulah Cushman.

Fiore, T. **Endothelial sarcoma of the upper lid** (tarsus). Ann. di Ottal., 1930, v. 58, Jan., p. 54.

The case reported was that of sixteen-year-old girl. Several years before her appearance at the clinic there had been noticed a slight drooping of the left upper lid, with difficulty in raising it. There had been no pain, excessive secretion, or tearing. Gradually the ptosis increased, the lid grew thicker, and a slight redness of the eyeball was present with a gummy secretion on the cilia in the morning. On inverting the lid a thick, smooth, elastic greyish-white neoplasm was found closely adherent to the cartilage. The mass was removed without difficulty. The growth was distributed evenly from two points of fixation, and was largely made up of small vessels in a weblike tissue, evidently endothelial tarsoconjunctival, and differing in character and location from cases previously reported.

Park Lewis

Gabrielidés, A. **Cytodiagnosis of epithelioma of the retina or retinoma.** Ann. d'Ocul., 1930, v. 167, April, pp. 265-285.

The difficulty and importance of correct diagnosis of retinal tumors is discussed. The most exact method is held to be by a puncture with a one millimeter needle in a Pravaz syringe. A small conjunctival flap is made and the needle is introduced through the retina into the tumor. Cauterization of the wound after withdrawal of fluid may be done. Two cases are described, giving the puncture findings and the histological descriptions of the enucleated eyes.

Lawrence T. Post.

Gala, Ant. **Treatment of carcinoma by diathermy.** Oft. Sbornik, 1929, v. 4, pp. 148-155.

After a brief description and discussion of different methods of treating carcinoma of the eye and its appendages, the author describes six cases of carcinoma of the lids and this surrounding area, in which diathermy yielded excellent therapeutic and cosmetic re-

sults. He finds diathermy a simple, easy method, which can be used in ambulatory patients. Its intensity and depth can be satisfactorily controlled. It destroys the cancer cells and their surrounding tissue directly. If the tissue is adequately coagulated there is no fear of recurrence. In otherwise inoperable cancer, it is the method of choice. *G. D. Theobald.*

Mayou, M. S. **Sarcoma of the iris.** Brit. Jour. Ophth., 1930, v. 14, April, p. 152.

About one hundred cases have been placed on record. Of the pigmented group there are those which definitely start in large pigmented nevi. In nearly all the cases the tumor consists of large spindle cells. These cells are characteristic of growths derived from nevi and it is probable that most of the tumors which are recorded as having been derived from the stroma of the iris may have had their origin from small nevi of the iris which have not been noted beforehand. The most frequent occurrence is in females between the ages of thirty-five and fifty-five, and usually located in the lower part of the iris. The tendency for the disease to spread into the fibers of the ligamentum pectinatum and canal of Schlemm occasions an early rise of tension.

The cases recorded by the author consisted of large spindle cells. The first was in a male who presented a peppered pigmented area on the iris. This was watched for thirteen years by which time it had increased in size and was of a spongy appearance. Microscopic sections showed the tumor to be a large pigmented nevus just becoming malignant. The second case, a male, aged 45 years, presented two raised swellings near the base of the washed out blue iris. Owing to increased tension the eye was trephined, but the hole ceased to drain. The sectioned eye showed a darkly pigmented growth situated in the lower angle of the anterior chamber and extending around its periphery in a ringlike manner. Case three was a female aged 48 years in which the tumor reached to the pupillary border. Case four was a male of 44 years. In the last two cases it is doubtful whether the tumor started in the iris or ciliary body but the balance of evidence favors the former.

The above cases show the various stages of the disease and its mode of involving the surrounding structures. The early involvement of the canal of Schlemm leading to increase in tension is of great importance from a diagnostic point of view since it may be the only means of distinguishing an innocent from a malignant tumor. According to some authorities the loss of mobility of the iris is an important factor in diagnosis, but this the author was not able to verify. Although the cases present varying clinical aspects, the histological changes so far as the cytoplasm of the cells is concerned are similar, which fact suggests that most of them have their own origin in nevi. (Eleven photomicrographs and four plates.) *D. F. Harbridge.*

Moore, R. Foster. **Choroidal sarcoma treated by the intraocular insertion of radon seeds.** Brit. Jour. Ophth., 1930, v. 14, April, p. 145.

A male, aged sixty-five years, presented in his useful eye a large globular mass in the lower part of the globe, vision 6/60. There were no keratic precipitates. A radium seed of one millicurie strength in a 0.5 mm. platinum filter was inserted through a small scleral opening overlying the body of the growth. An attached silk suture was used for removal at the end of fourteen days. During the presence of the seed a slight iritis was induced causing a small synechia at six o'clock. The patient was observed monthly during the following five months. In the region of the scleral incision was a dull brownish coloration, the slit-lamp showing this to be little colonies of pigmented cells which disappeared within a few weeks. After five months a second seed of five millicuries was inserted at the same site and allowed to remain ten days.

At the end of about eight months the growth showed definite signs of regres-

sion which continued gradually for the ensuing year, at which time it was only with difficulty that the shrunken irregular surface could be seen down back of the iris. The mass was reduced to about one-quarter of its original size. A star-shaped opacity in the posterior part of the lens completely disappeared. (Five illustrations and two field charts.) *D. F. Harbridge.*

Panico, E. **Primary cancer of the cornea.** Ann. di Ottal., 1930. v. 58, Feb. p. 179.

Primary cancer of the cornea is rather infrequent. It originates in the corneal epithelium and progresses through this tissue. It penetrates with great difficulty into the eyeball, as Bowman's membrane is markedly resistant to the cancer cell. Histologically it presents the same features as those of cancer elsewhere. (Bibliography.)

Park Lewis.

Puglisi Duranti, G, **Histoclinical contribution to a study of the extrabulbar pathway of propagation of melanosarcoma of the choroid.** Ann. di Ottal., 1930, v. 58, Feb., p. 134.

The case reported shows histologically that the elements of the tumor had invaded the natural passage of transmission, reaching in that way outside of the globe. The gross study of an eye in which there is a malignant tumor is not sufficient, as the microscopic findings may warrant evisceration in preference to simple enucleation.

Park Lewis.

Reese, Algernon B. **Extension of glioma (retinoblastoma) into the optic nerve.** Clin. reports New York Eye and Ear Infirmary, 1930, v. 1, March, p. 5.

The microscopic examination of one hundred and nineteen eyes enucleated for glioma with no extraocular extension showed that the tumor had invaded the optic nerve in sixty-three, or fifty-two percent. Of these sixty-three cases, fifty-one, or eighty-one percent, showed that the optic nerve had not been severed distal to the tumor extension. The author states that many of these cases could have unquestionably been cured if the nerve had been cut farther back, as it is routinely possible to obtain a nerve ten to twelve mm. or even longer. The average nerve-length of the cases studied was about three mm. *Phillips Thygeson.*

Shire, Frances W. **Bilateral sarcoma of the uveal tract.** Clin. reports of the New York Eye and Ear Infirmary, 1930, v. 1, p. 31.

A case of bilateral melanosarcoma of the uveal tract is reported, resulting in a fatality from visceral metastases seven and one-half years onset. The author describes the rarity of malignant disease involving the uveal tract of both eyes, and states that only seven cases of bilateral sarcoma have been reported in the literature.

Phillips Thygeson.

Zamenhof, A., and Arkin, W. **Two cases of hemangioma of the choroid.** Klinika Oczna, 1929, Dec., pp. 164-171.

In a case of retinal separation due to an intraocular tumor, an enucleation was performed. Pathologically a cavernous hemangioma of the choroid was diagnosed. In another case of choroidal neoplasm a similar diagnosis was made clinically because of (1) the benign course: no changes in the fundus were observed for a long period of time; (2) the presence of a vascular nevus on the same side of the face; (3) a greenish discoloration of the iris as the probable result of increased volume in the uveal blood circulation.

M. Beigelman.

16. INJURIES

Cattaneo, Donato. **Traumatic lesions of the posterior pigmented layer of the iris.** Ann. di Ottal., 1930, v. 58, Jan., p. 11.

Three cases are described of injuries to the eyeball in which the pigment layer was ruptured without affecting the integrity of the middle or anterior layers or breaking the pupillary margin.

The points of interest were that the rupture was discovered by means of the

slit-lamp, the light being thrown back of the iris. The absence of pigment was shown by transillumination, which also showed the relationship between the layers. Cases have been reported in which the stroma has been ruptured and the pigment left intact. In these cases the opposite condition was shown. The independence of the pigment and the stroma is here demonstrated pathologically. This is due in all probability to the different degrees of elasticity of these structures and of the elements of which they are composed, which is in harmony with their anatomical formation and embryologic origin.

Park Lewis.

Crocco, Arturo. **Intraocular metallic foreign body with conservation of vision.** Arch. de Oft. de Buenos Aires, 1929, v. 4, Sept., p. 555.

A thirty-four year old man had received a slight wound of the right eye twenty-two years previously which caused little trouble at the time. In the fundus examination during a refraction a small cylinder shaped body was seen above and external to the macula, of light color, and slightly smaller in diameter than the papilla. It was surrounded by a small white zone containing a little pigment, but the fundus showed no other alteration. The visual fields were normal, except for an absolute scotoma below and to the inner side of the point of fixation. The tension was normal, and no signs of anterior inflammatory changes were visible. On account of this body in the fundus he had been given intensive courses of antiluetic treatment. This mass had also been diagnosed as retinal separation, choroidal tumor, glioma, and hydatid cyst. The density of the body was shown by x-rays. The rarity of toleration of the interior of the eye to a metallic body is commented upon, and especially the preservation of normal vision. *A. G. Wilde.*

Dixon, George S. **Report on examinations for intraocular foreign bodies.** Clin. reports of the New York Eye and Ear Infirmary, 1930, v. 1, Mar., p. 3.

On the basis of experience gained from 6,120 x-ray examinations made for the purpose of determining the presence of foreign bodies in the eye or orbit, Dixon feels justified in making certain positive statements: (1) Glass plates make the only safe negatives for foreign bodies in the eye. (2) The intensity of the shadow cast by various substances will decrease in the following order: Lead, steel, iron, copper, brass, stone, plumbago (pencil lead), and glass. (3) Failure to demonstate the presence of a foreign body of iron or steel in the eye or orbit, if of appreciable size (0.1 mm.), is inexcusable. (4) A lead shot will retain its form if it does not encounter bone; if it does, fragments of lead or bone or both will be present. (5) A small steel foreign body may be retained in the eye long enough to become completely oxidized, leaving nothing but a rust spot, yet this may throw a shadow sufficiently strong to indicate its location.

Phillips Thygeson.

Donovan, John A. **Prognosis in eye injuries.** Jour. Amer. Med. Assoc., 1929, v. 93, Dec. 21, pp. 1934-36.

A brief but comprehensive review of the more common types of eye injuries, with conclusions drawn entirely from the author's personal experience of thirty years, is given. It is concluded that there will never be a time when any man, or group of men, can foretell the possible results of severe eye injuries, but the probabilities are that useful eyes can be obtained in a great majority of cases. In cases of multiple foreign bodies of the cornea, the author suggests that it is better not to try to remove too many at one time, as it produces too much irritation. (Discussion) *George H. Stine.*

Iofe, Z. M. **A study of the anterior segment of the eye in workers employed in the tobacco industry.** Russkii Oft. Jour., 1930, v. 11, pt. 3, pp. 305-313.

An examination of the eyes of one hundred workers employed in a tobacco factory did not reveal any appreciable

pupillary disturbances of the type reported previously by Hirschler, Raymond, Frank-Hochhart and others. The corneal sensibility, tested by the use of Samoilov's method, was found definitely lowered in the eyes of these workers. No conjunctival changes which could be attributed to tobacco dust were detected. *M. Beigelman.*

Sabata, Jan. **Chemical injuries of the eye.** Oft. Sbornik, 1929, v. 4, pp. 92-96.

The author describes the injuries, their treatment and results, in 117 cases of chemical eye injuries, admitted over a period of seven years at the Brno eye clinic. Ninety-nine were injured by various forms of lime, nine by organic acids, and nine by other substances. Great stress is laid on the immediate removal of the caustic element and of necrosed tissue, and on copious irrigation. Ointments and atropin are used in after treatment. Healing is more rapid after alkaline than after acid injury. The iris becomes involved more frequently after acid burns. Acids are not easily neutralized and cause denser corneal opacities. Sodium thiosulphate intravenously has been used recently, and seems to hasten the healing period.

G. D. Theobald.

17. SYSTEMIC DISEASES AND PARASITES

Deggeller, Z. B. **Ocular complications in furuncle or abscess of the face.** Russkii Oft. Jour., 1930, Mar., pp. 321-331.

In a patient of twenty-eight years, a nasal furuncle resulted in bilateral thrombosis of both cavernous sinuses. The infectious agent was transmitted most probably through the angular vein, without causing a thrombophlebitis of the orbital veins. The patient died from a purulent meningitis. In another case a prelacrimal abscess was followed by unilateral exophthalmos and ophthalmoplegia, as the result of a thrombophlebitis of the small retrobulbar veins. In the third case, a furuncle of the eyebrow was complicated by severe metastatic retinitis on the same side. *M. Beigelman.*

Ehlers, H. **Positive gonococcal complement-fixation reaction in some patients with ocular disease.** Acta Ophth., 1930, v. 8, p. 64.

The author reports five cases of uveitis in which the gonorrheal etiology was established through the complement-fixation reaction devised by R. Møller and M. Oppenheim. This is a valuable test in that it gives a clue to the etiology and indicates venerological examination and treatment. More extensive application of the test will reveal a greater number of gonorrheal uveitis cases and a proportionately smaller number of rheumatic cases.

Ray K. Daily.

Hudelo, A. **The mechanism of accommodation and diabetic myopia.** Arch. d'Opht., 1930, v. 46, Feb., p. 70. (See Section 3, Physiologic optics, refraction, and color vision.)

Pacalin. **Filaria of the upper lid.** Arch. d'Opht., 1930, v. 46, Feb., p. 108.

A forty-two-year-old man had a small tumor in the region of the upper lid, which appeared like a twisted cord. By grasping the cord with a fixation forceps and incising the skin, a nematode was removed. Later examination of the blood showed the presence of numerous embryos of filaria. The patient had been in Gabon (equatorial Africa) from 1913 to 1918.

M. F. Weymann.

Sabbadini, D. **Recurrent serous meningitis with special regard to ocular symptoms.** Riv. Oto-Neuro-Oft., 1930, v. 7, pp. 20-45.

The author reports five cases of recurrent serous meningitis with ocular symptoms. These symptoms included: papillary or peripapillary edema; unilateral or bilateral paresis of the sixth cranial nerve; and central scotomata, concentric contraction of the visual fields for colors, or homonymous hemianopsia. The general and local symptoms disappeared entirely in the course

of the disease, the edema and the hyperemia of the retinal veins being the last to disappear. The disease recurred once or more during the period of from six months to eight years after the first attack, and the ocular symptoms were more marked in some of the new attacks. Three of the cases showed normal conditions when last seen while one did not show any improvement. (Bibliography.) *Melchiore Lombardo.*

Santonastaso, A. **A study of a rare form of hereditary syphilis located exclusively in the eye.** Ann. di Ottal., 1930, v. 58, Feb., p. 117.

A monosymptomatic form of hereditary syphilis is apt to escape correct diagnosis. This study is illustrated by two patients, one a child of two years and one of five years, brothers, both having almost identical symptoms: clonic blepharospasm, nystagmus, pupillary torpor, compound hyperopic astigmatism, pigmentary dystrophy of the fundus. The familial character is emphasized: it was probably due to hereditary predisposition. In determining the diagnosis apart from the Wassermann test, the complex of symptoms is considered in extensive biographical references. *Park Lewis.*

Swab, C. M. **The histologic backgound of the ocular syndrome in botulism.** Arch. of Ophth., 1930, v. 3, April, pp. 437-450.

Among other introductory statements about the bacteriology and symptomatology of botulism, the author mentions that the extraocular muscles, retina, and optic nerve are sometimes affected. A résumé of the reported characteristic histological lesions includes hemorrhage foci in the oculomotor nucleus. Most writers consider the essential lesion to be a paralysis of the endings of the motor nerves to the voluntary muscles.

The author's experimental work was limited to a study of the lesions occurring in the ocular tissues of a number of animals. In dogs, dryness of the eyes and cornea was constant. In about fifty percent there was a dull central opacity also. Hypersecretion of saliva was present in one hundred percent of all dogs. Epiphora occurred in all. There was loss of the normal winking reflex. The pupils were dilated, but reaction to light was lost only immediately before death.

In rabbits there was no salivation. Dysphagia was constant. In five out of six of these animals there occurred dryness of the corneas. In the same number the pupils were dilated. One developed nystagmus and temporary convergence. One showed marked sympathetic irritability, the pupils dilating during excitement. Cocks recovered in all cases, showing only slight general weakness. Local injection into the anterior chambers of cats' eyes showed no apparent results. Rats and guinea pigs were too susceptible for satisfactory work.

The histologic changes, according to the author, in the third and fourth cranial nerves were "round cell infiltration; lymphoid cells packed into the parenchyma; extravasation of red blood cells; distention of capillaries with erythrocytes; stagnation of blood, migration of lymphoid cells; thickening of capillary endothelium; neurophagia, chromatolysis, satellitosis, necrobiosis, nuclear displacement, nuclear shrinking, vacuolization, powdery granulation of Nissl bodies and complete disintegration of the ganglion cells; increase of neuroglia".

There was diffuse round cell infiltration and massive extravasation of erythrocytes in the meninges. In the optic nerves occurred focal infiltration in the parenchyma, with diffuse increase of neuroglia and round cell infiltration of the pial and arachnoidal sheaths. In the retina there occurred fat formation in the ganglion cell layer; pyknosis, chromatolysis and vacuolization of the ganglion cells; a powder-like reduction of the pigment granules; engorgement of the vessels with red corpuscles and stagnation of blood. Throughout the choroid there was great infiltration with round cells, as was also the case at the corneo-scleral junction and in the

ciliary body. The exudate occurred for the most part around the vessels.

M. H. Post.

18. HYGIENE, SOCIOLOGY, EDUCATION AND HISTORY

Albertotti, G. **A case of spasm of the accommodation described by Dante in the "Convivio".** Ann. di Ottal., 1930, v. 58, Jan., p. 52.

In one of the poems of Dante's "Convivio" or "Banquet", the poet speaks of the blurring of a star while it is looked at. This effect Albertotti ascribes to accommodative spasm, although Patrizi had explained it is an example of retinal fatigue.

Park Lewis.

Fraticelli, A. **Review of an indemnity case by Professor Cirincione.** Ann. di Ottal., 1930, v. 58, Feb., p. 130.

In a railroad accident in 1902 a traveler suffered some minor injuries of the body especially involving the face. Clinical recovery followed in twenty or twenty-five days and the surgeon in charge reported that there would be no permanent consequences. Nine years later the case was reopened on the part of the claimant because of failing vision. It appeared that in 1908, six years after the accident, Professor Lodato had found simple bilateral descending optic atrophy, more accentuated on the left side. There was lateral hemianopia of the right with conservation of macular vision. In the left a scotoma extended fifteen degrees beyond the center of fixation. It was not primary atrophy but was dependent on a basilar lesion of uncertain origin.

The case went to the highest courts and two opposing opinions were offered by the most eminent oculists, one group affirming that the atrophy was due to the injury, the other that it was due to a hypophyseal neoplasm. The case was debated for years and became a cause célèbre. It was finally referred to Professor Cirincione, who by careful clinical reasoning demonstrated that the symptoms could not be produced by a fracture but were clearly due to pituitary pressure, radiography showing enlargement and alteration in the sella turcica. *Park Lewis.*

Koldovsky, Kvetoslav. **Statistical survey of eye diseases of members of insurance institute.** Oft. Sbornik, 1929, v. 4, pp. 113-126.

A statistical survey is made, covering a period of two years among the members of the Olomouce Insurance Institute. The author divides the members into three groups according to occupation, industrial, farm, and office workers. He discusses the frequency of diseases in the different groups, and cites some interesting individual cases. He finds lid affections and injuries most frequent in the first two groups, and conditions due to errors of refraction in the third. There are seven tables of detailed statistics. *G. D. Theobald.*

Wood, S. **A rare manuscript of Chevalier Taylor, the Royal Oculist, with notes on his life.** Brit. Jour. Ophth., 1930, v. 14, May, p. 193.

This is quite an exhaustive paper on one of the most extraordinary quacks of the early eighteenth century. Taylor catered to the eye needs of royalty and those in high places. He made a pretense of caring for the poor, but money was always acceptable. References, illustrations, and reproductions of portions of his writings accompany the contribution.

D. F. Harbridge.

NEWS ITEMS

News items in this issue were received from Drs. C. A. Clapp, Baltimore; Gaylord C. Hall, Louisville, and J. B. Potts, Omaha. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. Charles W. Kinney, of Flushing, New York, died May twentieth, aged sixty-eight years.

Dr. Benjamin Pomeroy Croft, of Greenfield, Massachusetts, aged fifty-nine years, died April twenty-ninth of a cerebral hemorrhage.

Dr. David Lemuel Bettison, of Dallas, aged forty-nine years, died May ninth of injuries received in an automobile accident.

Dr. Archibald Lyle Macleish, of Los Angeles, aged seventy-five years, died May twenty-second, of myocarditis and nephritis. Dr. Macleish was a graduate of Edinburgh University and was an important figure in ophthalmological circles in this country.

Miscellaneous

Recent appointments to the department of ophthalmology of Washington University, Saint Louis, include the following: Drs. J. W. Charles, Charles W. Tooker, and J. Ellis Jennings as lecturers in ophthalmology; Dr. William M. James as instructor in ophthalmology on full time; Dr. Rossleene A. Hetler as instructor in applied biochemistry (Ph.D. in biochemistry at Yale in 1926). Dr. Hetler will have charge of the problems of food and vitamin deficiencies relating to the field of ophthalmology.

The corner stone of the McMillan Eye, Ear, Nose, and Throat Hospital and the Oscar Johnson Institute of Ophthalmology and Otolaryngology at Washington University, Saint Louis, Missouri, was laid on May fourteenth. The president of the Board of Directors of the Hospital and Institute, Mr. Edwin H. Steedman, presided. After an introductory statement by Chancellor George R. Throop of Washington University, the Honorable Henry S. Caulfield, governor of Missouri, gave the address of the day. Dr. Harvey J. Howard outlined the plans for the department of ophthalmology, and Dr. Lee W. Dean the plans for the department of otolaryngology. The laying of the corner stone of the coordinated building was performed by Mr. William K. Bixby for the McMillan Hospital and by Mrs. Irene Walters Johnson for the Oscar Johnson Institute. At the time of the ceremony, construction of the building, which is to be fourteen stories in height, had reached the tenth story.

Societies

Dr. Arnold Knapp of New York was installed as president of the American Ophthalmological Society at its June meeting. Dr. Edward C. Ellett of Memphis, Tennessee, was made president elect, and Dr. Emory Hill of Richmond, Virginia, was reelected secretary.

The eye and ear section of the Kentucky State Medical Association held its meeting June fourth and fifth at Louisville. Dr. John F. Barnhill of Indianapolis was the guest of honor. The chairman of the meeting was Dr. Gaylord C. Hall of Louisville. A number of interesting papers were presented. The section will meet next year in Bowling Green.

Fellows of the American Academy of Ophthalmology and Otolaryngology should make early reservations at the Hotel Sherman for the Chicago meeting. The joint session will be held at nine a.m. on Tuesday, October twenty-eighth. The Section on Ophthalmology will meet in the afternoon of the twenty-ninth and thirty-first, the Section on Otolaryngology on the twenty-eighth and thirtieth; while the special lectures on progress in ophthalmology will be held on the thirtieth, and those on otolaryngology on the thirty-first. The guest of honor will be Professor Dr. Emil de Grosz, of Budapest. The presessional volume will be repeated this year, being mailed to each fellow of the Academy a few weeks before the time of the meeting.

Examinations in ophthalmology and otolaryngology will be held on Monday, October twenty-seventh. The secretary of the ophthalmological board is Dr. William H. Wilder, Chicago, and the secretary of the otolaryngological board is Dr. W. P. Wherry, Omaha.

Personals

On June sixteenth Boston University conferred on Dr. David W. Wells, of Boston, the honorary degree of doctor of sciences.

Dr. William H. Wilmer spent the month of July on his country place at Boyce, Virginia.

Dr. Jonas Friedenwald has been appointed lecturer in ophthalmic pathology at the University of Maryland.

Drs. William W. Blair and John S. Plumer of 121 University place, Pittsburgh, announce that they are associated in the practice of ophthalmology.

The current list of collaborators on the cover of the "Klinische Monatsblätter für Augenheilkunde" indicates that Dr. Engelking, formerly associated with Professor Axenfeld at the Freiburg clinic, has been made professor at Cologne.

Miss Ida Mann will give a course of lectures at the Wilmer Institute, in October, on the embryology of the eye. This is in addition to the course previously announced for Chicago and Denver.

Dr. Angus L. MacLean and Dr. Henry Graff have been appointed instructors in ophthalmology at the University of Maryland.

Dr. Herman C. Little has been made clinical instructor of ophthalmology in the medical department of Yale University.

Dr. Abram B. Bruner has been promoted to the position of associate clinical professor of ophthalmology in the Western Reserve School of Medicine, Cleveland.

Announcement has been received of the marriage of Miss Sara Frances Minard, of Boontown, New Jersey, to Dr. Arthur L. Bennett, of Buffalo.

A new dormitory for girls, costing $240,000, will soon be opened at the New York State School for the Blind. It will be named "Park Lewis Hall", after Dr. Park Lewis of Buffalo, who for a number of years has been president of the Board of Visitors of the school.